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The history and development of newspaper electronic pagination systems in the United States, 1975–1987

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New York University, 1990

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THE HISTORY AND DEVELOPMENT OF NEWSPAPER

ELECTRONIC PAGINATION SYSTEMS IN THE

UNITED STATES, 1975-1987

Nouri Beyrouti

Nouri Beyrouti 1989

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ACKNOWLEDGMENTS

It has been more than five years since I came to New York University and started my doctoral studies; this dissertation study was initiated more than three years ago. As the process of completion draws to a close, I cannot help but express my feelings of gratitude to the many people whose help, guidance and loving concern made it all possible.

To the faculty, both past and present, of New York University Center for Graphic Communication Management and Technology, a heartfelt thank you. Special acknowledgment is made to the members of my dissertation committee, Dean Arnold Spinner, Dean Gabriel Carras and Professor Robert Swerdlow, for their invaluable contributions and continued support. Dean Spinner served as Chairman of the committee and was a constant source of inspiration and patient understanding, who never gave up on my ability to succeed at this task.

Gratitude is also extended to the following people at the American Newspaper Publishers Association (ANPA): Joseph J. Lorfano, Assistant Manager, Public Affairs; George R. Cashau, Director of Technical Research; Peter R. Romano, Director of Technical Services; and Don Teschner, Production Engineer. A special note of thanks goes to Earl Wilken for his valuable assistance and guidance during the study.

For their inspiration and loving care, this document is dedicated to my children, Mohamed Ali and Nourhan, for having accepted uncomplainingly, competition with the project for my attention; and for their loving devotion, my everlasting thanks.

And finally, to my wife, Hana Z. Beyrouti, for her infinite love, pride in me, and her never-ending support and patience -- without it this document would not have been possible.

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CHAPTER I

INTRODUCTION

> The business of making a newspaper is in a
> state of constant growth and change.[1]

Newspapers have undergone many changes in recent

decades. The comparison of a recent issue of an

American daily newspaper with an issue published half a

century ago would show marked improvements.[2] These

include: better typography, improved make-up, greater

readability, clearer photographic reproduction, use of

color, carrying more classified linage and improved

presentation of display advertising.[3] In addition, the

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[1]Whitelaw Reid, _The New York Tribune_ (1879) quoted
in Frank W. Rucker and Hervert Lee Williams, _Newspaper
Organization and Management_, 3rd ed. (Iowa: The Iowa
State University Press, 1969), p. 101.

[2]Frank Thayer, _Newspaper Business Management_ (New
York: Prentice-Hall, Inc., 1954), p. 23.

[3]See: Michael L. Kleper, _The Illustrated
Dictionary of Typographic Communication_ (Pittsford, New
York: Graphic Dimensions, 1983); _Typography_, the
process of selecting, arranging and using type; _makeup_,
arrangement of headlines, text, art and other elements
on the page (usually with rubber cement or adhesive);
readability, the degree to which copy can be read with
ease; see also, Ronald P. Lovell, _The Newspaper: An
Introduction to Newswriting and Reporting_ (California:
Wadsworth Publishing Co., 1980), pp. 336-337;
classified, small advertisements sold by the square
inch to customers seeking or offering goods, services,
housing, employment and so forth; _display advertising_,

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physical properties of the newspaper have improved—
advancement has been in the production process and
higher journalistic standards.

Each stage in the creation of the newspaper and
its content is being rethought in the seventies and
eighties, and at each stage research leads to revision
of concepts in redesigning production technology.[4]

Electronic imaging technology (text and graphics)
has moved into the newspaper industry as computers and
other production technologies have evolutionally
changed pre-press, press and post-press production
methods (1940's to present).

There are four areas of the newspaper operation in
which electronic imaging technology has had a
significant impact:

> Business functioning of newspapers, using
> computers to accelerate general business
> accounting and circulation operations.
>
> Classified and display ad operations, using
> "front-end" systems and layout systems.
>
> Composing room, speed of computers and software
> programs, coupled with reductions in their size
> and cost, opened the way for their adaptation to
> newspaper production. The need for large numbers
> of printers and composing room personnel has been
> reduced.

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newspaper advertisements designed to promote products
by means of headlines, copy blocks, illustrations and
imaginative arrangement.

[4]Antony Smith, Goodbye Gutenberg: The Newspaper
Revolution of the 1980's (New York: Oxford University
Press, 1980), p. 72.

Electronic delivery systems, such as facsimile,
microwave, satellite and wire service satellite
delivery systems, have changed the circulation,
marketing and management concepts about handling
these factors.

Faced with constantly changing and increasingly

complex technologies, newspaper organizations have

spent millions of dollars on new production technology

and modern presses to offer greater operating effi-

ciencies, improved reproduction, and greater printing

flexibility. During the last decade, explosive growth

in telecommunications has created a host of new oppor-

tunities for the newspaper business to improve its

internal operations and to develop new competitive

business. The New York Times, for example, and The

Wall Street Journal, became national newspapers by

printing editions in Chicago, Los Angeles, and San

Francisco, using satellite transmission.

Elizabeth G. Berglund, editor of American Printer

and Lithographer, reported in an article published in

May, 1980, that:

Buffeted in recent years by advertising
losses to television, shoppers and suburban
papers, metropolitan newspapers increasingly
look for the dollar savings and higher
productivity that comes from the adoption of
new technology. It is these sobering
problems that make "practical" the password
as newspapers enter the 1980's. During the
recent past, they were concerned with
advanced technology. But economic events
have forced them to turn their attention to
the practical development of systems to make

that technology operational. Above all, is a
realization on the part of newspapers'
managements that they must change to sur-
vive.[5]

The development of electronic systems, such as

those using optical character recognition (OCR) input

techniques, also called scanners, which read type-

written newsroom copy and transmit it either to a

computer or a tape which is used to activate the

typesetting machine, now passé as previously designed,

are being supplanted by intelligent character

recognition (ICR) techniques, using artificial

intelligence software. Video display terminal (VDT)

input devices aided the process for introducing text

into computer systems for ultimate typesetting pro-

cesses. The output from the typesetter permitted for

paste-up, and the start of partial area composition and

full-page pagination systems which provided for full-

page make-up. All of these electronic systems have

provided an excellent base for the newspaper industry

to reduce some of the costly labor-intensive (composing

room personnel) and materials functions, such as film,

phototypesetting paper, proofreading and paste-up.

The present decade will see the newspapers
of this country move from costly slow

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[5]Elizabeth G. Berglund, "Newspapers: A Quest for
System Integration," American Printer and Lithographer,
May, 1980, p. 41.

production systems to highly efficient low-cost production.[6]

To provide for higher quality lower cost production, many newspapers today are gradually replacing their stereotyping, composing and make-up equipment with expensive automated machinery.[7]

The implementation of these new technologies and the installation of the latest generation equipment has provided the newspaper industry the ability to maintain a more competitive position vis-a'-vis TV and radio. It is obvious that only companies with good strategic planning and the ability to make changes, will survive in this changing marketplace.

Be not the first by whom the new is tried,
nor yet the last to lay the old aside. The
challenge is to know when--and be prepared--
to make changes.

Newspaper Production

There have been two technological revolutions in the newspaper industry since Gutenberg invented movable type in the 15th century.[8] The first began in the 1880's when Mergenthaler invented the linotype, a

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[6]William D. Rinehart quoted in Rucker and Williams' Newspaper Organization, p. 43.

[7]Jay H. Loevy quoted in Rucker and Williams' Newspaper Organization, p. 60.

[8]Johannes Gutenberg invented movable type about 1440.

typecasting machine that cast a solid line, or slug, of letters which enabled a printer to set type faster and more economically instead of setting type one character at a time at a rate of one newspaper line a minute.[9] In 1885, Tolbert Lanston invented the Monotype, which cast individual letters, to be assembled into a line of type.[10] These processes were referred to as "hot-type" composition, which had been the traditional method for preparing newspaper pages by printers according to a layout specified by editors or designers.

The second revolution dates to the 1940's, which marked the beginning of photocomposition (photo-typesetter), also known as "cold-type" system, which used optics and electronics to project images of letters on photosensitized paper. And during the later 1960's, the phototypesetters started to use computer technology to advance the output capabilities. Photocomposition technology is generally divided into four generations of typesetters: the first three generations (two photo, one CRT) required that the

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[9]Ottmar Mergenthaler (1854-99), German mechanic, is credited with inventing the Linotype machine.

[10]Tolbert E. Lanston is credited with inventing the first Monotype machine in 1885.

printing plate be made from photographic film or paper onto which the letters were flashed; fourth generation technology involves using the strength of the laser beam to imprint the letters directly onto film, paper and/or printing plate. Newspapers have saved hundreds of millions of dollars as a result of abandoning "hot-type" composition and embracing the new technology ("cold-type" composition system), cutting the composing room staff in the process. Antony Smith, in his book Goodbye Gutenberg, stated that:

> In the new equipment that started arriving in the 1960's (offset press, photocomposition, then computerized typesetting), publishers rapidly realized that, function for function, new equipment was cheaper than old, and more flexible, more labor-saving, more efficient.[11]

The offset printing process gained importance during the 1960's and 1970's. It developed in conjunction with improvements in cold-type by photocomposition methods. Hundreds of small and medium-sized newspapers switched from letterpress printing to offset printing. In the late 1950's, fewer than 200 newspaper in the United States were printed by offset methods; by early 1964, the number had risen to 1,400, and by 1968 it was more than 5,000; by 1978, an estimated 94% of the nation's more than 7,500 weeklies

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[11]Smith, pp. 131-132.

and 72.2% of its 1,778 dailies were printed by off-set.[12] Cold-type encouraged flexibility in appearance, for it is easier to move paper and photographic nega-tives on a paste-up page than to position lead type. The offset process of printing provided a better quality of reproduction for pictures (halftones sharper) and illustrations. Advertisers, as well as readers, were impressed by this fact.

Systems that would produce entire (broadsheet, tabloid) pages at one time (pagination) were introduced in the 1970's, and at the same time, there were elec-tronic ad (advertisement) layout (make-up) systems in use but which were not integrated with full-page pagination systems. These early pagination systems left holes for the graphic elements in the page. However, some pagination systems for classified pages (agate) could paginate the entire page if graphics were not included.

Efforts to develop full-page pagination systems in the 1970's were slowed by the difficulty of handling graphics, but the Associated Press, which revolu-tionized its handling of pictures with the development

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[12]Ernest C. Hynds, American Newspapers in the 1980's (New York: Hastings House Publishers, 1980), p. 266.

of the Laserphoto system and the electronic darkroom,

provided techniques for the realization of the goal in

the 1980's.

Frank Romano wrote that,

> Newspapers were first in paper tape; first in
> phototypesetting; first in digitized composition;
> first in computers for typesetting; first in laser
> platemaking; and now, first in pagination.
> Actually, pagination should have been the first
> 'first', but it appears that it will, in fact, be
> the last 'first'.[13]

> Newspapers have always paginated but now
> they want to bring to that area the same
> automation and efficiency that has been
> brought to bear in typesetting, editing and
> other functions.[14]

Robert E. Schweitz, vice president and editorial

director of The Army Times Publishing Co., Washington,

D.C., predicted that

> The entire composition process will soon be
> superseded by a new electronic pagination process.
> Editors will be able to make up pages on CRTs,
> photos and all. When the elements of each page
> are as the editors likes them on his screen, he
> presses a key and that page is composed on
> photosensitized material which is then ready for
> the camera or plate department. There is no
> paste-up step under such a system.[15]

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[13]Ibid.

[14]Frank Romano, "Toward the Brave New World of
Electronic Newspapers," American Printer, May 1981, p.
41.

[15]D. Earl Newson, The Newspaper, Everything You
Need to Know to Make It in the Newspaper Business (New
Jersey: Prentice-Hall, 1981), p. 76.

Pagination will do for the newsroom in the 1980's what electronic editing did in the 1970's. Total newsroom control of the composition process, typographical standards and quick page changes, will allow for later deadlines. These are among the major advantages of pagination.[16]

In 1980-1982, and still today, it was the capture, storage, and manipulation of graphics that provided the last major block to development of practical computer-to-plate pagination systems.

The beginning of full-page pagination with graphics came in 1982 with the introduction of Gannett Graph Pro by Hastech, using an ECRM Autokon camera for graphics and installation of an Information International, Inc., full-page pagination with graphics system at the Star-News in Pasadena, California. These systems were capable of displaying both text and graphics on a VDT screen in true form.

Possible savings by daily newspapers in the near and distant future from full-page pagination systems with graphics is an accepted fact by knowledgeable industry people, according to Joseph M. Ungaro,

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[16]Fane L. Burt, "Pagination," APME Continuing Studies Committee Report, Telecommunications and Technology (San Diego, 1982), p. 17.

publisher of the Westchester Rockland Newspapers, White
Plains, New York; Howard Collins, editorial director of
the Pasadena, California Star-News; and Bruce Adameit,
newsroom technical coordinator of the Minneapolis
Tribune. All agreed that total newsroom control of the
composition process, typographical standards not seen
since hot-type days, quick page changes and later
deadlines, are among the major advantages of
pagination. Savings to offset the high capital
investment must come from cuts in production personnel,
they said.[17]

In addition, Joseph M. Ungaro estimates that
pagination systems and direct-to-plate production have
the potential for saving the industry more than two
billion dollars yearly when fully implemented. And in
addition to savings on labor and materials, Charles J.
P. Gallagher, production director at The Observer
Dispatch in Utica, New York, cites improved efficiency,
tighter control and better deadlines for both news and
pictures as being other major advantages promised by

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[17]Frank D. Simmons, "Dream System Pressed into
Service," Telecommunications and Technology (1982),
p. 4.

pagination and computer-to-plate.[18]

The advent of pagination means that some of the resources formerly expended in traditional composing rooms will be cycled into the news department. As Howard Collins, editorial director of the Pasadena, California Star-News, put it:

> The revenue pie is only so big and I am willing to help reduce the size of the production department's slice so my newsroom can have a bigger piece.[19]

And as Scott B. Hunter reported,

> With pagination, you have more control over the product. You get a look at the complete page before it is set.
>
> You can probably also gain some time in the newsroom. While it may take some pages longer to produce electronically, the time made up by skipping the backshop could be enormous.
>
> Pagination might even help us be better prepared for an uncertain future in the rapidly-changing information society.
>
> A pagination system might help newspapers compete effectively with electronic news delivery via videotext or teletext. A product that is cheaper to produce and more timely in terms of the news content will help the printed word to compete.[20]

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[18]Jim Stommer, "What Will it Mean in Cost, Time, Quality?" Telecommunications and Technology (1982), p. 7.

[19]Ibid.

[20]Scott B. Hunter, Pagination Comes a Long Way, Telecommunications and Technology (San Francisco [1985]), p. 3.

Walter Mattson, formerly production manager and now president of <u>The New York Times</u>, said in a commentary,

> The rush of publishers to use modern technology for daily publication will help in the cost side of the business. Ultimately, more diversity may be available for the public with editions targeted for specific audiences opening up some pages to advertisers who cannot afford a full press run.[21]

Statement of the problem

This researcher traces the development of newspaper electronic pagination systems (NEPS) and identifies and describes the emerging trends in U.S. newspaper pre-press production during the period from 1975 to 1987.

Subproblem 1

To provide historical background of the pre-press production technologies that were utilized by the daily newspaper in the United States prior to the consideration of electronic pagination systems.

Subproblem 2

To trace the introduction of electronic partial and full-page pagination systems in the daily newspaper

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[21]Berglund, p. 45.

industry in the United States from 1975 to 1987.

Subproblem 3

To identify, describe and analyze, the emerging trends in U.S. newspaper pre-press production technologies.

Definitions

Daily Newspaper is published at least five days a week and is listed in the newspaper section of Editor & Publisher's International Year Book. Researcher reference to "newspapers" means daily newspapers.[22]
Full-page Pagination Systems for the newspaper industry, with continuous graphics capabilities, have been under development for a number of years. Page make-up systems allow an operator to perform, under realtime control, text editing, file management, on one screen. Stories, headlines, and photograph can be selected from directories and instantly positioned in any desired location on the page. Interactive column format, sizing/scaling/cropping, and all other layout functions are executed through a conventional alpha-numeric keyboard and simple-to-use graphics tablet.

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[22]Benjamin M. Compaine, "The Daily Newspaper Industry in the United States (1977): An Analysis of Trends in Production..." (Doctoral dissertation, Temple University, 1978), p. 7.

Also in cold-type systems, this is called paste-up,
which means everything on the page--headlines, body
type, a velox of every photo, rules and dashes--is
pasted into a full-scale mockup of the page to be
photographed and processed into a plate by whatever
platemaking system the newspaper uses. Pasteup may be
seen as an intermediate step on the way to full-page
pagination, the ultimate goal of full-scale
automation.[23]

Page Make-up Station is a large display tube that can
call from the database any text in hyphenated and
justified format, actual font and point size.[24]

It is also a visual display terminal (VDT) es-
pecially designed to lay out whole pages.[25] A unique
pagination terminal allows the operator to see the ad
exactly as it would appear when set in type. An
operator may use all of his artistic and manipulative
skills to lay out the ad properly. The page layout
function generates a screen image of the completed
newspaper story or ad, and can also show the layout of

---

[23]Westley, News Editing, op. cit., p. 53.

[24]Berglund, p. 43.

[25]Bruce U. Westley, News Editing, 3rd e. (Boston:
Houghton Mifflin Co., 1980), p. 375.

an entire page.[26]

Pagination the electronic era term for page layout on a
video display terminal. Pagination, when used with
other electronic editing and printing equipment, offers
a number of advantages. One can arrange a page as you
want it--you see body type, headlines, outlines, boxes
and blanks for photographs. When you press the "Go"
button, the page zips through the computer and comes
out full size, ready to be photographed in the
platemaking process.[27] Pagination is a production
system in which editors lay out pages on a video
display terminal (VDT) and the full page is produced
from a photocomposition machine. Pagination systems
permit editors to program a number of preset page
layouts. The material for a page will be entered and
the computer will be told to select an appropriate
layout. At the same time, pagination systems permit
designers to experiment with type placement and sizing
in ways not previously possible.[28]

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[26]N. Edward Berg, The New Era in Composition, TAGA
Proceedings (Rochester, New York: n.p., 1978),
pp. 351-352.

[27]Martin L. Gibbon, Editing in the electronic Era
(Ames, Iowa: Iowa State University Press, 1979),
p. 208.

[28]Daryl R. Moen, Newspaper Layout and Design
(Ames, Iowa: Iowa State University Press, 1984),
pp. 50, 52, 55.

Pagination will combine in one step on a video display terminal the creative task of editors in positioning stories, headlines, pictures and other graphics on a page dummy and the actual paste-up of these materials on a page by a compositor. It will enable the editor to see precisely how his stories and headlines fit, or do not fit, what the page will look like when composed, and give him total control of its creation. It will save time and money in producing pages and facilitate the most effective and attractive use of space available.[29]

Partial Pagination is to electronically display components of page layout, text, headlines and captions on a VDT, leaving holes for pictures and graphics, which later on are stripped in place manually. Also, it is used to assemble everything except art on a terminal large enough to accommodate a full page and then output the page to a phototypesetter, so that in the end we have a negative ready to be converted into a plate[30]

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[29]Hynds, pp. 274-275.

[30]Paul A. Tattersall, "Directions of Full-page Composition," R.I. Bulletin No.1198 (Easton, PA: American Newspaper Publishers Association Research Institute, August 20, 1975, pp. 209-217; "Joint Effort Announced for Pagination System," Editor & Publisher, January 11, 1975, p. 32.

<u>Pre-press Production System</u> involves all aspects,
activities of preparing printed material from writing
the text, editing, typesetting, proofreading, paste-up,
scanning art, making films and, finally, plates ready
for press. Also, a system is more than a mere col-
lection of pieces of hardware, or even of hardware and
software. It is also a collection of people and pro-
cedures, services, support facilities, customs, expec-
tations, and perhaps even legal arrangements. It re-
presents the way things get done.

The Need for the Study

The purpose of the researcher is to detail the
history of newspaper electronic full-page pagination
systems. The researcher hopes that this study will
serve as a guide for a complete and clear understanding
of the development of electronic pagination systems
installation in the daily newspaper industry in the
United States. It is also hoped to promote greater
understanding of graphic arts technology and science in
general--and moreover, to provide recommendations for
future research.

Limitations of the Study

The study provides a history of the development of electronic pagination systems, tracing growth and development from the experimental beginnings in 1975, to 1987.

The year 1975 marked the advent of area composition and the progress made by the Newspaper Systems Development Group (NSDG) in association with IBM, Raytheon, Singer, Autologic, ECRM and Versatec. They researched a full-page composition system,[31] using special software programs and peripheral devices to output full-page without graphics on a typesetter. The year 1987 marked the advent of newspaper full-page pagination systems with graphics (line art and halftones), comprise the period under study. The investigator is restricted to daily newspapers in the United States, which are considered the ultimate users and test field for electronic composition and pagination systems.

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[31]Paul A. Tattersall, "Directions of Full-page Composition", R.I. Bulletin No.1198 (Easton, PA: American Newspaper Publishers Association Research Institute, August 20, 1975), pp. 209-217; "Joint Effort Announced for Pagination System," Editor & Publisher, January 11, 1975, p. 32.

The Method[32]

General Statement of Method

This researcher makes use of historical data, and is descriptive in style. It provides a comprehensive profile of the development of newspaper electronic pagination systems (NEPS). The collection of materials was subjected to external and internal criticism in accordance with procedures indicated by Jacques Barzun and Henry F. Graff,[33] and by Louis Reichenthal Gottschalk,[34] to insure reliability,[35] validity,[36] and credibility,[37] of the data. The materials collected were subjected to internal and external criticism in order to verify the following:

    1. Is the author identified?

    2. Where did he write the material?

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[32]For all publication information on all sources, see bibliography.

[33]Jacques Barzun and Henry F. Graff, The Modern Researcher (New York: Harcourt, Brace & World, Inc., 1970).

[34]Louis Reichenthal Gottschalk, Understanding History, A Primer of Historical Method (New York: Alfred A. Knopf), 1950.

[35]Ibid., pp. 118-138.

[36]Ibid.

[37]Ibid., pp. 139-170.

3. Was the author an eyewitness of the events he describes?

4. What was his purpose in writing the document?

5. Was the author in a position to know and tell the truth?

Each of the subproblems of this study was divided into secondary questions. Answers to these secondary questions resulted in the solution of each of these subproblems. This procedure enabled the researcher to proceed with the study in a systematic manner.

A survey (telephone interviews) which served as a major source of data needed for subproblem 3, was conducted with key persons[38] in the daily newspaper industry.

The telephone survey method was chosen over the mail survey or face-to-face interviews because of its speed of implementation and rapid compilation of sensitive data[39] about new and sophisticated computer

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[38]Names are compiled from The Editor & Publisher's Year Book, and from lists provided by the American Newspaper Publishers Association (ANPA); also some key figures will be chosen from the ANPA itself for their long outstanding research and expertise in daily newspaper production technology.

[39]Borg & Gall, "Educational Research, An Introduction" (1983), pp. 446-448. There is some evidence that telephone interviews can be used to collect sensitive data. And many groups, such as business and executive people, are easier to reach by telephone than by personal visits.

technology used by the daily newspaper industry. It is still premature to conduct in-depth analysis of its impact upon the daily newspaper industry.

The aim of the telephone survey was to obtain general answers for open-ended questions, giving the researcher, and later the reader, timely information. Use of the open-ended question has been advocated by many researchers, including Kerlinger who argued that since these questions provide only a frame of reference for the respondent, they place a minimum of restraint on answers from the respondent.[40]

The work of Claire Selltiz, Lawrence S. Wrightsman and Stuart Cook,[41] were consulted for questionnaire techniques,[42] sampling techniques,[43] and treatment of the data.[44] Furthermore, the book, Mail and Telephone Surveys: The Total Method by Don Dillman, was a major

---

[40]Fred N. Kerlinger, Foundations of Behavioral Research (New York: Holt, Rinehart, Winston, 1973), p. 481.

[41]Claire Selttiz, Lawrence S. Wrightsman and Stuart W. Cook, Research Methods in Social Relations, 3rd ed. (New York: Holt, Rinehart & Winston, Inc., 1976).

[42]Ibid., pp. 512-540.

[43]Ibid., pp. 542-563.

[44]Ibid., pp. 456-497.

resource in the development of a useful telephone survey.[45]

Procedure

Changes in printing technology have been a factor since the mid-1960's. Thus, the literature research has been concentrated on graphic arts books, dissertations and theses, periodicals, journals and trade sources dating from 1970.

Sources checked included:

Dissertation and Thesis Abstracts, 1950-1987

Graphic Arts Technical Foundation Abstracts, a Digest of Scientific, Technical and Educational Information for the Graphics Communications Industries, 1970-1987.

Primarily, contemporary sources included:

American Printer

Editor and Publisher Graphic Arts Monthly

Journalism Quarterly

Printing Impressions

Publishers' Weekly

Among the most valuable sources for data gathered from trade association meetings and publications of invaluable aid were the Research Bulletins issued by the American Newspaper Association/Research Institute

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[45]Don A. Dillman, Mail and Telephone Surveys (New York: John Wiley & Sons, 1978), pp. 200-225.

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(ANPA/RI), and _Presstime Magazine_ and the Associated Press Managing Editors Telecommunications and Technology Committee Reports (APME), published annually. _The Seybold Report on Publishing Systems_, issued regularly, is the most valuable of materials covering technical developments in pre-press production technology, and especially in the newspaper industry since 1970. Speeches at various industry gatherings are a goldmine of information. Conclaves, such as the ANPA/RI Production Management Conference each June, the ANPA Convention in April, as well as regional and international shows and conventions and the Technical Association of the Graphic Arts (_TAGA Proceedings_) in Rochester, New York, are other extremely valuable resources. Press releases and technical reports, sales brochures and catalogs published by newspaper and electronic pagination systems firms served as valuable data sources.

The survey, consisting of telephone interviews with top executives of newspapers and newspaper publishing companies, was also a valuable data source. The objective of the survey is to establish insights, obtain critical appraisals, and probe for new ideas, and to gain facts.

Secondary sources were made use of as follows: primarily, books dealing with graphics communications

technology. The Wall Street Journal and Business Week
which cover the newspaper industry on a regular basis.
Fortune and Forbes also have features on newspaper
publishing companies or the industry.

The researcher was designed to provide a
chronological account of the development of newspaper
electronic pagination systems, and the overriding
purpose of the research is to provide a basis for
further, more detailed research. As such, the
character of the present research is exploratory.
According to W. I. B. Beveridge:

> Scientific research may...be divided into the
> exploratory type, which opens up new territory,
> and the developmental type, which follows on the
> former. The exploratory type is free and
> adventurous; occasionally it gives us great and
> perhaps unexpected discoveries; or it may give us
> no results at all.
>
> Developmental type of research is more often
> carried out...to search over the newly-won country
> for more modest discoveries, and to exploit fully
> the newly-gained territory by putting it to use.[46]

The researcher does not attempt to examine in
depth the technical or extraordinary aspects of
particular systems. It does attempt to ferret out or
discover the essential characteristics of the various
types of NEPS.

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[46]W. I. B. Beveridge, The Art of Scientific
Investigation (New York: Random House, 1957), p. 171.

After completing data collection, investigation and categorizing, the research patterned the materials in a combination of topical and chronological order, although the materials were subjected to the processes of external and internal criticism, as mentioned previously.

Procedures in Collecting and Reporting Data·

This research is a historical study of a major event in the development of electronic pagination systems in the daily newspaper industry in the United States. Subproblem 1 is considered in order to understand the background of the newspaper pre-press production processes and the setting of newspaper electronic pagination systems (NEPS) history subsequent to 1985. No technology arises or develops in a historical vacuum. All history is the effect of prior cause. Therefore, it is necessary to go back, at least as far as the Gutenberg invention of moveable type, and as late as the nineteenth century as the Mergenthaler invention of the Linotype, and to subsequent computer applications and area composition and early development of partial and full-pagination systems, to determine why and how newspaper electronic pagination systems (NEPS) developed, to ascertain the

nature of its growth and demand in the daily newspaper industry in the United States.

In order to clarify the presentation of the method of this research, the process of collecting and reporting data is presented separately under the head of each subproblem.

Subproblem 1: To provide a brief historical background of the pre-press production technologies that were utilized by the daily newspaper industry in the United States prior to the installation of electronic pagination systems.

Data Needed

As a background to the development of newspaper electronic pagination systems (NEPS) in the United States, data needed are related to the graphic arts history prior to the development of NEPS.

Sources of Data

The selection of primary and secondary sources for all of the subproblems depends upon the following categories in relation to graphic arts communication and technology: books, trade magazines, technical reports, association reports. The materials from the various sources are presented in narrative style, using paraphrasing, quotation and direct references to substantiate the findings of the research.

The foregoing major steps entail the procedures that the researcher used to collect and treat the materials. The purpose was to determine the place of each subproblem within the framework of the main problem and to understand the subproblem.

Treatment of Data

All data collected were subjected to external and internal criticism as previously mentioned. The data was examined and carefully analyzed and placed in a combination of topical and chronological order to provide an accurate account and analysis of newspaper pre-press production operations and technologies prior to the development of the NEPS.

In order to obtain the information necessary for the solution of subproblem 1, the following questions were posed:

1.   What was the status of graphic arts methods of reproduction and communication prior to Gutenberg?

2.   What was the nature of significance of Gutenberg's invention of moveable type and Mergenthaler's invention of the Linotype, first mechanical casting machine?

3.   What principles underlie the development of the photocomposition process?

4.   What are the different phototypesetter generations' development and their significance in presenting solutions for setting type?

5. How has page make-up been achieved
    in the daily newspaper pre-press
    production system environment?[47]

The answers to the questions and the solutions for

this subproblem examine the historical background of

the graphic arts and newspaper pre-press production

operations.

The historical background for this subproblem was

investigated in graphic arts books, printing and

publishing books, newspaper production books, trade

publications which have contributed, in aggregate or in

part, to deliberations on newspaper pre-press pro-

duction technology. Primary sources were used whenever

possible.

Information pertinent to this subproblem was

extracted. The researcher carefully reviewed and

studied these sources for significant historical data.

Sources and data were subjected to recognized scholarly

procedures for external and internal criticism, ac-

cording to Gottschalk, Barzun and Graff as mentioned

previously.

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[47]For all subproblems, where questions other than
those listed arise, they too were posed to the actual
respondents and any others which emerged during the
course of the research.

Subproblem 2: To document and describe the introduction of electronic partial and full-page pagination systems in the daily newspaper industry in the United States from 1975 to 1987.

Subproblem 2 is considered to understand and to document the evolution and development of newspaper electronic pagination systems in the United States from 1975 to 1987.

To assist the researcher in gathering, quoting and evaluating information for this subproblem, the following questions were posed:

1. How have the basic computer concepts been applied in text processing of various input and output devices?

2. What are the various forms of input into a typesetting system and the role of typewriter and optical character recognition (OCR) scanner in that course?

3. What is the significance of the video display terminal (VDT) in the newspaper industry--its use in text processing, page make-up and editorial control of copy flow?

4. How have layout and page make-up systems been developed and applied to text processing output, and what is their significance in the evolution of newspaper electronic classified ad pagination systems (NECAPS)?

5. What principles underlie the formation of the Newspaper System Development Group (NSDG) to join forces with IBM and seven other vendors to perfect a full-page composition system in 1976?

6. What is a full-page classified ad pagination system?

7. What kind of basic information does
    it require in order to perform its
    task?

8. What is a display ad system? How
    and when is it used?

9. What is the interrelation between
    display ad systems and pagination?

10. Who were the leaders in developing,
    introducing and implementing a
    full-page pagination system?

11. What are the basic components of
    full-page pagination systems--
    system architecture?

12. What are graphics, as distinguished
    from type?

13. How have graphics been handled in
    the context of pagination?

14. What is the significance of a data
    base and what are the physical
    requirements for data storage?

The answers to the questions and the solutions for

this subproblem document and analyze the introduction

of electronic pagination systems into the newspaper

industry in the United States from 1975 to 1987.

The data needed for this subproblem was collected

from trade publications, newspapers, manufacturers of

pagination systems' annual and technical reports, the

Seybold Report on Publishing Systems, the American

Newspaper Publishers Association/Research Institute

Bulletin. Primary sources were used whenever possible.

Information pertinent to this subproblem was ex-

tracted. The researcher carefully reviewed and studied

these sources for significant data. Sources and data were subjected to external and internal criticism according to Gottschalk, Barzun and Graff as mentioned previously. Special attention was given to the reliability of overstatement or understatement in the case of judgmental and evaluative criticism.

Subproblem 3: To identify and analyze the emerging trends in U.S. newspaper pre-press production technology.

Subproblem 3 is considered in order to identify and analyze the emerging trends in pre-press production technology and its implications for the newspaper industry in the United States. A survey was conducted of managing editors and production operations managers known to be actively engaged in introducing, implementing and managing pagination systems. The survey was limited to those individuals and newspapers known to be utilizing electronic pagination systems.[48] The number of individuals involved in the actual application of such technology is relatively small; consequently, the number of possible respondents was limited. However, the survey attempted to establish insights, obtain critical appraisals, and probe for new

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[48]List of newspaper pagination projects and key production managers provided by ANPA. See Appendix A.

ideas, as well as to gain basic facts.   The thrust of
the survey was toward breadth, not depth.

Their names and affiliations are as follows:

Bob Arrington, Technical Service Manager
  The Daily Oklahoman, Oklahoma City

Vern Bean, Production Manager
  Cocoa Today, Cocoa, Florida

Joe Blackwell, Production Director
  Alexandria Daily Town Talk, Alexandria,
  Louisiana

Bob Farquhar, Director of New Systems
  The Daily Oklahoman, Oklahoma City

Charles Gallagher, Production Director
  Daily Press & Observer-Dispatch, Utica, New York

John Gallant, Director
  News Journal Corporation, Daytona, Florida

John Phillips, Production Director
  Phoenix Newspapers, Inc., Phoenix, Arizona

Gerald Polk, Production Director
  Long Beach Press-Telegram, Long Beach,
  California

Peter Romano, Director of Production Department
  ANPA Research Institute

Thomas E. Rice, Production Director
  News & Sun Sentinel Co., Ft. Lauderdale, Florida

Larry Stasulis, Production Manager
  The Reporter (Gannett), Lansdale,
  Pennsylvania

Joseph Ungaro, President & General Manager
  Westchester-Rockland, New York

Lester Wiltse, Production Director
  Pasadena Star-News, Pasadena, California

Pete Walker, Production Director
  Rocky Mountain News, Denver, Colorado

Paul Zindel, President
   The Register-Star, Hudson, New York

A special attempt was made to contact sales and marketing, as well as corporate communications per-sonnel at Hastech and Triple I. Together these companies are representative of the most ambitious research and development of electronic pagination systems for the newspaper industry in the United States since the 1970's, and the most thorough and systematic in attempting to apply computer technology to the main-stream of newspaper production.

Individuals were selected for this survey because of their positions and experience in newspaper elec-tronic pagination systems. Letters of inquiry were first sent to the prospective interviewees.[49] In the week following, telephone calls were made to these individuals. Each interview was conducted from a uniform list of questions.[50] However, the telephone interview method allowed for considerable latitude in follow-up questions.

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[49]See Appendix B for sample letter form.

[50]See Appendix F for telephone survey questionaire.

In order to validate the telephone interview

questionnaire, a jury or panel of experts[51] was

selected and requested to check the instrument for

clarity, for proper expression and validity of the

items. They were also requested to eliminate those

items which they consider should not be included on the

basis of repetition, lack of objectivity and validity,

and to add others they considered valid.

Significance of the Study

Very little has been written about the evolution

of electronic paginations systems in the daily

newspaper industry in the United States. And no

organized historical account has been written about the

development of the NEPS prior to this study.

The American newspaper industry, a highly

diversified, $26.7 billion industry, employing over

427,000 people,[52] never had the "glamor" that other

industries acquired; so this industry as a whole, and

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[51]Because they are frequently cited in the
literature as experts or frequently address newspaper
executives' gatherings on technology or are otherwise
widely recognized as being legitimate authorities
concerning newspaper production and electronic
pagination technology.

[52]U.S. Dept. of Commerce, Bureau of Industrial
Economics, U.S. Industrial Outlook for 1985
(Washington, DC: Government Printing Office, 1982),
pp. 27-2/27-4.

particularly pre-press production technology, was never the subject of intensive intellectual scrutiny. For example, the impact of automation on the American newspaper industry has been analyzed in only three doctoral dissertations in the last twenty-five years[53] and two master theses which preceded electronic news-layout systems.

Because of the craftsmanship and the complexity of newspaper pre-press production operations, it has been subjected to continued changes so that it might serve various economic factors. Whitelaw Reid from The New York Tribune wrote in 1874, "The business of making a newspaper is in a state of constant growth and change".[54]

Jonathan Seybold, commenting upon the underlying motivation for the changes which he forecast in the April 9, 1984 issue of The Seybold Report on Publishing Systems, said,

> ...not the promise of directly measurable labor or materials savings, but rather a desire to change the nature of the publication's production process ....People perceive present processes as messy, time-consuming, fraught with aggravation and difficult to control. They are beginning to realize that they do not

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[53]An extensive computer data base search of Dissertation Abstracts International was conducted on April 19, 1986, by the research staff of University Microfilms International.

[54]Whitelaw Reid, The New York Tribune (1879) in Rucker and Williams, p. 101.

have to live like this any more. They are
anxious to streamline and simplify the entire
process, to shorten deadlines, to gain
control.[55]

Faced with these changes, chief executive officers

and managers of production operations must make deci-

sions of greater dollar amounts than ever before. Con-

sultants, as well as financial, supervisory, production

and technical personnel, are usually called upon for

advice and counsel.

Historians, printers, publishers, newspaper

executives, journalism students and educators, graphic

arts students and educators interested in the develop-

ment of NEPS in the United States should find this

study useful and a valuable guide.

In addition, this study will be of great value in

providing guidance in strategic planning for future use

in Lebanon and other Middle Eastern countries (Pan

Arab) and as a document for teaching purposes in

journalism and graphic arts colleges, thereby making it

possible for students to gain a basic knowledge of

NEPS.

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[55]Jonathan Seybold, The Seybold Report on
Publishing Systems, April 9, 1984, pp. 7-12.

The researcher focuses on goals, expectations and changes, allowing Lebanese[56] decision-makers more extensive information on trends in American newspaper pre-press production and use of their resources to promote international coordination, and to work toward reducing uncertainty.

Now, after forty-five years of constant change and improvement in the pre-press production operations in the U.S. daily newspaper and the introduction of electronic pagination systems, a comprehensive document of NEPS should be available in order to promote greater understanding of graphic arts technology and science in general.

In an important sense, this study cannot present any "conclusions" since the processes of change described briefly here are still rapidly unfolding, as are the future implications of NEPS on newspaper production methods.

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[56]Lebanon's estimated literacy rate is 86%, the highest in the Pan-Arab world. This is reflected in the number of newspapers published and the importance of the printing industry. The first Lebanese newspaper began in the 20th century. Today, there are 52 political dailies, published primarily in Arabic, but also in French, English and Armenian. The total circulation is approx.300,000 for leading newspapers. There are also 207 weeklies and 170 monthlies with a circulation of over 300,000, dealing with a variety of subjects, including highly specialized fields of knowledge. Lebanese citizens spend about 24 million pounds ($6 million) a year on their newspapers. Facts About Lebanon, Ministry of Information, Beirut, 1978.)

I hope that this study provides a perspective on an important set of changes in the art and craft of newspaper production technology. I trust such a perspective can reveal reliable information about where we have been and where we are at present, and I hope that it provides at least reasonable hypotheses about where we seem to be going.

CHAPTER II

HISTORICAL BACKGROUND

On pre-press production technologies uti-
lized by the daily newspaper in the United
States prior to the consideration of elec-
tronic pagination systems.

Graphic Arts Reproduction Prior to Gutenberg

It is very likely that man has been communicat-

ing graphically with his fellows for more than 100,000

years, dating back to the paleolithic period.[57] The

first examples of writing, though, probably date back

to about 6000 B.C.[58] Early writing was accomplished on

a variety of materials including papyrus and clay tab-

lets, on which the writer, usually a priest or scribe,

drew or inscribed pictorial symbols of physical objects

or pictograms.[59] The use of pictograms or pictographs

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[57]Jonathan Seybold, The World of Digital
Typesetting (Media, PA: Seybold Publications, Inc.,
1984), p. 1.

[58]Ibid.

[59]Anthony smith, Goodbye Gutenberg: The Newspaper
Revolution of the 1980s (New York: Oxford University
Press, 1980), p. 4.

to designate physical objects only, gradually began to evolve to encompass concepts too, or ideographs.[60]

The history of writing and graphic communication is shown to be a quest for an ever better and more efficient way to record permanently and with clarity significant information. Thus, it is not surprising that at some point in time, the somewhat ungainly ideographs that were used to communicate written information began to change still more. It is thought that somewhere between 4000 and 800 B.C., written symbols began to represent sounds instead of things and ideas.[61] This was an event which, Seybold notes: "was said to have taken over a thousand years," and which may very well have been "the most important event in the history of our civilization."[62] The development of the alphabet from its Phoenician origins meant that writing could now move out of the supernatural or embraced by government and business as a useful tool.[63] As with the development of written symbols, the materials and processes used to produce them also evolved into increasingly efficient forms. Writing that was

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[60]Seybold, p.1.

[61]Ibid.

[62]Ibid.

[63]Smith, p. 4.

originally gouged into wet clay tablets with a stylus, which were preserved by baking, eventually began to be placed on other more convenient surfaces, such as papyrus, animal skins, and wooden tablets coated with wax.[64] The invention of papyrus particularly helped encourage the establishment of ancient libraries, for this material was considerably thinner than clay tablets, and larger amounts of information could be stored in a fairly small space.[65] The use of the stylus changed over time as well, from a gouging tool to a reed pen which conveyed simple red or black inks onto the writing surface.

Eumenes II of Pergamum perfected the making of vellum, or parchment and had written upon it some 200,000 volumes of research and scholarship. His library, as well as the fabulous Alexandria collection, containing up to 700,000 manuscripts were ransacked by enemy forces, and according to Smith these losses, particularly the destruction of the Alexandria collection "[s]ymbolically...left a chasm in man's intellectual sphere; a totality of knowledge had been lost."[66]

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[64]Seybold, pp. 2-3.

[65]Smith, p. 4.

[66]Ibid., p. 5.

Thereafter, man endeavored to regain knowledge lost, as time destroyed the elements which preserved it, and memory was considered a short-term system for preserving it.[67]

While mankind endeavored to replace the lost knowledge, improvements continued to be made in the reproduction process, although very slowly. For centuries, manuscripts continued to be produced on parchment in medieval Europe, and religious institutions again came to be the keepers of knowledge. Monastic orders devoted themselves to the preservation, correction, and copying of valuable manuscripts.[68]

When paper arrived in Europe as a generally available commodity, around the thirteenth century, it provided the possibility for a more economical means of producing manuscripts and gradually began to become popular with students who often copied their favorite manuscripts.[69] Paper had actually been in existence for several centuries before this, invented around the second century A.D. in China and travelling into Europe via the Moorish invasion of Spain in the twelfth

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[67]Smith, p. 5.

[68]Ibid.

[69]Ibid.

century. Paper mills were built in Moorish Spain then, but the first mill in Christian Europe, was not built until around 1270, in Fabriano, Italy.[70]

Although paper was more economical than parchment, hence its popularity with students, its use was initially discouraged or even banned by the Church, because of its "alleged Moslem or Jewish origins." It wasn't until the widespread use of the printing press that paper began to be used instead of parchment.[71]

While the use of parchment persisted until the Renaissance, the form of manuscripts had begun to change long before, around the fourth century A.D. Prior to this time, manuscripts had been transcribed onto rolls of parchment, which consisted of sheets pasted together end to end. Now the sheets began to be bound together into a codex. They were folded into signatures of four pages and attached along their folds.[72] McMurtrie (in Seybold) describes how a typical book was reproduced during this period:

> ...The monastic scribe worked about six hours daily. He received his parchment in sections, each sheet separate but folded and arranged in the order which it should appear in the book as finally bound. After the decision as to the style

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[70]Seybold, p. 3.

[71]Ibid., p. 4.

[72]Ibid.

and size of the writing to be used, the limits of
the written page were ruled in with 'blind'
marginal lines, the parchment being held in place
with awls. In addition, to the lines of writing
were ruled upon the parchment with a blunt
instrument which made a little furrow in the
material. Inasmuch as parchment has two distinct
sides, a quarternion, or signature, was arranged
so that each two facing pages had the same
character - that is, both were hair side or both
were flesh side.

After the scribe had finished his quarternion, or
group of four sheets in eight leaves, his work was
proofread in comparison with the original by a
second person, and the sheets were then sent to
the rubricator, who inserted titles, headlines,
chapter or other initials, notes, and the like. If
the book was to be illustrated, the sheets next
went to the illuminator. After he had completed
his work on the volume, it was ready to be
bound.[73]

As books became more and more popular in medieval

Europe, the monastic libraries began to provide a co-

operative registry of their books, and universities

began to grow, connected with these "church institu-

tions." It was the flourishing of universities, which

caused a book trade to develop, which soon surpassed

the capacity of the stationarii or book dealers to

provide manually prepared copies.[74] Smith notes that

"Printing in Europe developed directly from this

unfulfilled requirement for text in scribal society.[75]

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[73]Ibid.

[74]Ibid., p. 5.

[75]Smith, p. 7.

At about this time also, enlightenment and interest in the arts and academia began to rise appreciably, hailing the beginning of the Renaissance.[76]

Gutenberg and the Advent of Printing

Gutenberg's invention and perfection of movable type coincided with a series of economic and social factors that naturally aided its success. For centuries, monastic copyists had been racing against time to copy ancient manuscripts before they disintegrated of natural causes. Yet the demand for updated and better copies continued to increase.[77] By the beginning of the Renaissance, the illuminators who produced illustrations for manuscript copies were carving them from wooden blocks, a technique which had been in use for many centuries.[78] Printing texts from carved wooden blocks was considered too time-consuming, but Gutenberg and others were working on ways to produce reusable type that would considerably speed up the process and enhance the ease of production.

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[76]Seybold, p. 6.

[77]Smith, p. 7.

[78]Arthur T. Turnbull and Russel N. Baird, The Graphics of Communication, 2nd ed. (New York: Holt, Rhinehart & Winston, Inc., 1968), p. 12.

Johan Gutenberg of Mainz, Germany is almost universally credited with being the founder of modern printing. But he was not the only one working on the printing process, and some authorities assert that a Dutch man, Laurens Coster, actually produced similar printing two years earlier than Gutenberg.[79] Gutenberg's invention, however, solved the major problems of printing in his day to such a degree that his techniques were used for centuries afterward and still survive to this day in some types of printing.[80] Not only did Gutenberg create a "system of movable type" that allowed letters to be rearranged and reused, he discovered a fairly simple and accurate method of making these letters in quantity. Further, Gutenberg devised a system to hold the type in place, as well as create the type impressions on paper, and finally, he developed an effective ink to use in this process.[81]

Gutenberg, above all, wanted to have reusable type. He had tried carving type from wooden blocks but found that these imprints did not last well when subjected to the force needed to get a good imprint of

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[79]Ibid.

[80]Ibid., p. 13.

[81]Ibid.

ink on paper.[82] With borrowed money, Gutenberg

obtained the help of a founder, who helped him cast

raised letters on metal blocks. This type, he found,

was sufficiently strong for the intended purpose.[83]

With the new metal type, Gutenberg produced his first

printed piece, the forty-two line Gutenberg Bible in

1454, considered to be a masterwork of printing.[84]

Another leaflet printed by Gutenberg's press around the

same time was a commissioned papal indulgence, entitled

"A Warning to Christendom Against the Turks."[85]

Gutenberg followed the lead of the monastic

copyists in establishing a similar standard of print

quality for his Bibles and other printed work. For

example, his type was designed in varying widths to

allow him to create illusion of "standard width

spacing."[86] Westley notes that copyists of Gutenberg's

day achieved standard width spacing by varying the

width of the letters as opposed to the spaces. Contem-

porary printers, however, do the opposite and vary the

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[82]Bruce H. Westley, <u>News Editing</u>, 3rd ed. (Boston: Houghton Mifflin Co., 1980), p. 33.

[83]<u>Ibid</u>.

[84]<u>Ibid</u>.

[85]Seybold, p. 6.

[86]Westley, p. 33.

width of the spaces to make a line fit a certain space.[87]

As has been noted, Gutenberg's processes were of such efficiency that they continue to be used to this day. Almost everything about the type, its shape, size, height, hardness, and composition (a mixture of antimony, zinc and lead), has survived.[88] Other elements of Gutenberg's press and process that have survived remarkably intact were the special frame he designed to hold the type in place and his printing ink, consisting of oil and lampblack.[89] In fact, the only part of Gutenberg's process which has undergone significant change was his printing press, based on the screw-driven wine presses of his day.[90]

Gutenberg's printing press, while it produced only a modest twenty impressions in one hour,[91] was still a vast improvement over the prevailing practice of rubbing the back of each sheet to be printed with a wool

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[87]_Ibid_.

[88]_Ibid_.

[89]_Ibid_.

[90]Seybold, p. 9.

[91]Westley, p.33.

pad in order to transfer the ink.[92] Using a similar

principle, Gutenberg had a cabinet maker design a press

which applied uniform pressure to inked type and paper

via a heavy plate or platen.[93]

Although Gutenberg, himself, died in debt, his

contributions to printing held vast significance, both

on an immediate and long term basis. His achievement

was inextricably entwined with the Renaissance and a

new enlightenment. The Gutenberg press was both cause

and effect of the times in that the new era encouraged

his progress and later was amplified by the spread of

printed work throughout Europe. The cultural signif-

icance of Gutenberg's work was that it provided a new

"reality" for civilization. Anthony Smith, in Goodbye

Gutenberg, comments on the significance of this:

> ...It takes a very long time for realities to
> become facts. When Gutenberg overturned 1500
> years of of scribal practice, he set about
> performing the tasks of scribes to the greater
> convenience of his customers who could henceforth
> purchase books more cheaply. But the new reality
> was a change in the nature of knowledge, in the
> whole function of the scribes. A change in the
> storage and dissemination processes must bring in
> its train a major shift in the realities of
> information power and in the relationship between
> all of society and all of the information to which
> it gives rise. There was once a great shift in
> the focus of knowledge that we have come to label
> the Rennaissance, a hungering after the

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[92]Seybold, p.9.

[93]Ibid.

augmentation of knowledge, rather than the repetitive collation and recovery of knowledge. Scribal society, with its image of the totality but inaccessibility of knowledge gave way to the reality of the infinite reproducibility and progressive corrigibility of all information, which led to the individual ownership of each successive accretion of knowledge.[94]

Thus, the invention of movable type opened a world previously closed to all but a few and paved the way for successive centuries of increasing democracy. The birth of printing also "created and sustained" the newspaper, bringing entertainment and knowledge reliably to the masses.[95]

Merganthaler and the Age of Machine Set Type
Between Gutenberg and Merganthaler

Johan Gutenberg's achievements, remarkable as they were, still did not solve all of the problems which arose from the subsequent growth of the printing industry over more than three centuries. For one thing, his screw-driven press, while perfectly adequate for small operations, quickly proved too slow for heavy printing schedules. For another, there still was no way to reliably automate the setting of type into lines until Merganthaler, and so this was largely accom-

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[94]Smith, pp. 313-314.

[95]Westley, p. 33.

plished by hand until the Linotype was developed in the 1880s.

Gutenberg's screw driven press was updated in colonial times by a faster, easier method, utilizing a spring-action lever to bear pressure on the paper and platen.[96] Another version of this, the "platen press", is still used widely in small print shops. The platen press uses a spring-action concept, but opens and closes like jaws and features inking rollers that roll down over the type while the jaws are open and return to an ink source while the jaws are closed, before re-peating the process.[97]

While sheets were originally fed into these machines singly and by hand, later this manual process was supplanted by machine feeding.[98]

The demand for printed material and the growth of newspapers was augmented by the development of steam power and the cylinder press. While steam power was successfully used in book publishing after its advent in 1822, the demands of newspaper publishing required an even faster method than was accomplished with a flat

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[96]Ibid.

[97]Westley, pp. 33-34.

[98]Ibid.

platen.[99] Thus, a cylindrical drum was installed instead of a platen.[100] The cylinder had a sheet of paper around it and moved over the flat type surface which "shuttled back and forth."[101]

Even these improvements did not provide the speed of production needed for large newspapers with circulations in the tens or hundreds of thousands. Continuous sheet printing was needed and several developments helped bring about the rotary press which solved the problem of speedy production for all practical purposes. Printers had made some improvements in production time by developing revolving type machines such as the Hoe Type Revolving Machine. Now the type, as well as the impression cylinders could revolve, enabling several printing cycles to be accomplished at one time.[102]

Because the Hoe Type Revolving Machine required the placement of countless pieces of type onto the large cylinder, it too was an overly time-consuming process. This led to the development of stereotyping,

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[99]Turnbull, p. 16.

[100]Ibid.

[101]Westley, p. 34.

[102]Turnbull, pp. 17-18.

in which "perfect facsimiles" were made in metal of pages that had been composed in movable type.[103] Now the facsimiles rather than the individual type could be attached to the cylinders. Stereotyping, although used as early as 1690 in Germany and other parts of Europe, was perfected and credited to Claude Gennoux in France in 1829.[104]

With the perfection of stereotyping processes, which permitted whole pages of flat type to be transferred to a curved surface, came the development of continuous-roll paper.[105] This allowed the development of rotary presses in the 1860s, whose curved type cylinders could revolve at tremendous speeds, and print both sides of a continuous sheet of paper at once.[106] It is the rotary press which has operated and continues to operate in the pressrooms of most of the largest newspapers in this country. Westley (1980) comments on the efficiency and speed of rotary presses in News Editing:

> ...So it was the combination of stereotype plate and continuous roll paper that made rotary presses possible, and rotary presses attained speeds far

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[103]Ibid.

[104]Ibid.

[105]Westley, p. 34.

[106]Turnbull, p. 19.

greater than anything that preceded them. In fact, the emergence of the truly mass-circulation metropolitan dailies in the latter part of the nineteenth century, was made possible by the high-speed multi-unit rotary press that is still found in the pressrooms of a great many newspapers in the ninth decade of the twentieth cen-tury. To print, say, 600,000 copies of a forty-eight page paper in the span of an hour and a half requires several banks of multi-unit presses. No other printing process has been quite as fast and generally satisfactory, despite, a number of special problems...[107]

The Linecaster: a Revolution in Newspaper Printing

By the mid-nineteenth century, printers had largely solved the "plate-to-press" part of the print-ing problem. But what about typesetting, which was still basically being done by hand more than three centuries after Gutenberg's invention of movable type. Even though a rotary press could now print some 24,000 twelve page papers an hour at the New York Herald, in 1882,[108] it still took a single compositor about three

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[107]Westley, p. 34. Westley comments that "between the cylinder press and the rotary press, there is another type that is often found in small daily and large weekly newspaper plants", called the "flatbed web-perfecting press", still in use today. Its advantages were that it printed directly from page forms and used continuous-roll paper. This was a serviceable but noisy press subject to inconsistent quality.

[108]Turnbull, p. 19.

hours to set a single column of type.[109] Many printers

tried for decades to develop automated methods of type

composition, and of 173 patents registered for type-

casting devices between 1822 and 1925, some 57 preceded

Merganthaler's linecaster.[110] But it was the Linotype

linecaster, in 1886, that successfully solved the

typesetting problem and it, along with the Lanston

Monotype, in 1887, and later the Intertype linecaster,

became the basic automated typesetting machines used in

the U.S. newspaper industry until the 1970s.[111]

Mergenthaler's automated linecasting machine was an

incorporation of three separate functions in one

machine, that is, "escapement and assembly, casting,

and distribution.[112] It both created the type from hot

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[109]Westley, p. 34.

[110]Seybold, p. 40.

[111]Ibid.

[112]Westley, p. 35. Westley describes the
Linotype's functions as follows: "...brass mats stored
in a sloping magazine, one letter to each channel, were
assembled when the operator at a special keyboard (1)
released a mat by striking a key. A mat dropped (2)
onto a sloped continuous belt and was carried to the
'stick' (3); wedge-shaped space bands were released
when the operator struck a space bar and dropped into
the stick from above. When the line was full, the
operator raised the stick and the line of mats and
space bands was carried into the casting mechanism (4).
There, after the line had been justified by raising the
space bands enough to fill it out, the 'mouthpiece' of
the caster (5) moved into place behind the line and hot
metal was squeezed into a space the shape of the line,

metal and, distributed and assembled it into lines. Besides speeding up the composing process immensely, it also improved the quality of the printed product because type pieces were never re-used, but were continuously remolded for each application.[113]

The Linotype had additional advantages over hand set type. Whole lines, or slugs were simpler to manipulate and less likely to get mixed up.[114] Plus, the problem of line justification was immensely reduced, because compositors no longer had to insert spaces experimentally between words, wasting large amounts of time to justify individual lines of type.[115] Seybold notes that:

> Variable spaces created by space bands took the place of fixed spaces of varying widths, and all the operator had to do was to bring the line

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with the reverse image of the line of type on top. The mats and space bands were then raised to the point where a long elevator arm carried the mats to the top of the magazine...while the space bands were restored to their waiting position. The distribution mechanism (6) restored the mats to their original channels while solid lines of type were being ejected into the galley (7). (Courtesy of On Line Systems' Production News): Figure 3.1.

[113]Seybold, p. 41.

[114]Ibid.

[115]Ibid.

within justification range. The actual
justification was in fact accomplished by space
band expansion.[116]

The initial Linotype machines, which were put into

production at several newspapers were not without

problems, and it took several years of improvements to

make them function efficiently.[117] For example, "when

it was first introduced, the Linotype used blasts of

air to move type molds; the later models [after 1890]

let the force of gravity pull the molds into

position."[118] Some of the problems experienced with the

linecaster included the tendency for type matrices to

occasionally find their way to the wrong magazine. It

also sometimes happened that the "bank operator," who

removed incorrectly set slugs, removed correctly set

ones, or put them in the wrong order, since he was

ordinarily reading them backwards and upside down.[119]

One year after Mergenthaler's Linotype was in-

troduced, Tolbert Lanston, in 1887, produced the

Monotype typecaster. This machine cast single letters

instead of lines and was really two separate machines.

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[116]Ibid.

[117]Turnbull, p. 21.

[118]Ibid.

[119]Seybold, p. 48.

One of the machines, a typewriter-like device, punched
holes in a tape which was subsequently fed into the
other, a casting machine, to guide its production.[120]
Another linecaster, the Intertype was developed later
than the Linotype and Monotype, but it was very similar
to Mergenthaler's machine.[121]

With the advent of the linecaster, mass production
of daily newspapers had truly arrived, particularly in
the United States. For the next ninety years, until
about 1970, when "they were no longer made in the
United States," over 100,000 linecasters were produced
and sold.[122] Truly, the impact of Mergenthaler's
Linotype on printing, particularly the newspaper
industry has been enormous. The Linotype caused a
revolution in printing that was felt through out the
world. Goble (1984) noted that besides the nearly
90,000 Linotypes that were produced for use in the
United States up until 1971, "Some 40,000 more were
manufactured in other countries, including the Middle
East and Far East.[123]

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[120]Turnbull, p. 22.

[121]Seybold, p. 40.

[122]Ibid.

[123]George Corban Goble, The Obituary of a Machine:
The Rise and Fall of Ottmar Mergenthaler's Linotype at
U.S. Newspapers, paper submitted for doctoral degree at

Photocomposition: The Second Revolution

Shortly after World War II, new technology was developed which would again significantly change the printing process. Printers were increasingly aware of the need for a more efficient and less costly system than the letterpress method advanced by Merganthaler and Gutenberg, and were especially interested in photocomposition processes. This was because more and more printing was already being done by offset or lithography.[124] The lithographic process itself had come about in 1796, when an unknown Bavarian actor/playwright, Alois Senefelder, discovered "that he could print from the flat surface of a stone."[125]

Senefelder found that the stone would absorb both oil and water, but that when ink was applied to the entire surface of the stone, only the portion covered by the oil (or waxed crayon in Senefelder's case) would accept the ink and print it on the paper.[126] Westley

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Indiana University, November, 1984, p. 2.

[124]Seybold, p. 72. The author notes that "Offset lithography differs from direct lithography in that the image is first transferred from the printing plat to a rubber cylinder and in turn, offset, onto the printing paper". (p. 11)

[125]Turnbull, p. 24.

[126]Westley, p. 36.

notes that this type of "planographic printing, or printing from from a plane surface," is still used to make fine prints by artists and printers.[127]

Later, the concept of photolithography, or offset, was developed from this same principle. The offset plate, produced photochemically, contains image, and non-image areas. The image areas will absorb grease, and thus ink, while the non-image areas will not.[128] The term offset comes from the fact that the image is not printed directly from the inked plate to the paper. Instead the image is first transferred to a "rubber blanket on a roller", and then onto the paper itself.[129] This procedure was discovered "accidentally," by an American lithographer, Ira Rubel, who incorporated it into a lithography process in 1905.[130] Before the development of offset lithography though, other de-

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[127]Ibid.

[128]Ibid., p. 37.

[129]Ibid.

[130]Turnbull, p. 25. Turnbull notes that "Rubel incorporated the transfer, or offset, idea into a press he introduced in 1905. A special cylinder covered with a rubber blanket was used to receive the image from the plate and in turn, to 'offset' the image onto paper. The Harris Brothers of Niles, Ohio, who were manufacturers of a rotary letterpress machine, also introduced a press with a plate-to-rubber blanket principle in 1906.

velopments were taking place which would affect the future of lithography, as well as newspaper printing immensely. One was the replacement of the stone beds of the lithography presses in the late nineteenth century, with thin zinc plates, which were wrapped around a drum, and which made a direct rotary lithography press possible.[131] The other, was the development of photography and the photoengraving process, which allowed for the reproduction of photographs, and ultimately their transfer onto offset plates. This was a major discovery for, until the late 1800s, printers were forced to use woodcuts to illustrate their publications and newspapers2.[132] Many inventors concerned themselves with the development of a successful halftone photoengraving process, including William Talbot, who probably made the first halftone in England in 1852, when he used a cloth screen covered with sensitized coatings "to put a continuous tone image on a relief printing plate."[133]

Later, in 1878, Frederic Ives, perfected the process which is generally considered as the modern

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[131]Turnbull, p.25.

[132]Ibid.

[133]Ibid.

photoengraving process. The first halftone plate used in an American newspaper was made by Stephen Horgan in 1880.[134] The idea of photography had been around since 1827, when Joseph Niepce first produced photographs in Europe.[135]

Thus, the processes which ultimately led to the introduction of photocomposition in the years following World War II, had been in the making for more than one hundred years before. By the time the Intertype Fotosetter was undergoing its first tests in 1946, offset lithography as printing process was already fairly well established and being increasingly used in Europe and North America.[136] Printers increasingly realized that the convenience of printing from planographic plates, as opposed to the raised type of letterpress, made the latter process a liability in cost, and efficiency.[137]

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[134]Turnbull, p. 23. notes that Morgan's "reproduction of 'Shantytown' was used by the New York Daily Graphic on March 4, 1880".

[135]Ibid.

[136]Seybold, p. 72

[137]Ibid. Seybold notes that printers were vigorous in their efforts to find a way to transfer the photographic process to letterpress production. He writes: "In fact, elaborate techniques had been devised to provide either the equivalent of a photographic positive from metal by printing 'reproduction' (or 'repro') proofs directly on a transparent carrier or by

Another development that added significantly to
the desire of printers to develop a more efficient way
to operate prepress production was the development of
the Teletypesetter in the 1930s.[138] This machine
speeded up the output of the Linotype linecaster by
allowing the machines to be operated by the use of a
perforated paper tape (one on the advantages of the
Monotype) rather than the more lengthy process of
typesetting directly from the linecaster. Even though
the "potential speed of the perforators" was cut down
by the need to justify lines, the improvement in
production time was still significant.[139] This process
was followed, in the 1950s by the development of wire
services who could speed up the production process even
more, by sending perforated tapes of newscopy to
newspapers who were "subscribers."[140] As newspaper
editing styles and procedures tended to become in-
creasingly uniform with the increased usage of per-

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rubbing the type form with carbon black, then
burnishing the surface, and photographing the form
itself. This latter process was known as 'Brightype'".

[138]Ibid.

[139]Ernest C. Hynds, American Newspapers in the
1980s (New York: Hastings House Publishers, 1980), p.
264.

[140]Ibid.

forated tapes, newsrooms became increasingly automated,
paving the way for the next revolution in printing, the
introduction and development of photo-typesetters,
which ultimately replaced the centuries old process of
letterpress, introduced by Gutenberg and perfected by
Merganthaler.

Phototypesetting and Its Generations

The advent of the Fotosetter, which was introduced
in 1950, and shortly afterward, the Photon typesetter
in 1951, heralded the end of the letterpress process,
also known as "hot type," because of the fact that type
was produced from molten metal. It signalled the be-
ginning of the era of "cold type" processes which uti-
lized photographic and lithographic techniques in a
variety of typesetters.[141] These machines are described
in terms of "generations," because they tended to fall
into certain categories of technological development,
and the many individual machines developed, are more
easily discussed from this point of view.[142] Thus,
phototypsetting machines can be seen as arriving in
four generations of differing technology, of which the

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[141]Hynds, p. 264.

[142]Seybold, p. 84.

Fotosetter, was the first.

There were basically two first-generation photo-
typesetters, the Harris Intertype Fotosetter, and the
Monophoto, introduced in 1950 and 1955, respectively.[143]
Seybold also notes that the ATF typesetter could also
have been considered a first-generation machine, al-
though it originated from slightly different principles
than the other two. While the Fotosetter and the
Monophoto were based directly on the original letter
press design, the ATF typesetter, was based on the
tradition of the typewriter.[144]

First-generation phototypesetters, as indicated,
were designed directly upon the principles of the hot
type letterpress machines they followed. Even though
they made use of photographic technique to "expose type
images on photographic film or paper" instead of
casting these directly in hot metal, they still
followed the same basic operating design as their
predecessors.[145] The Harris Intertype Fotosetter was
operated by keyboard and closely resembled the

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[143]Ibid., pp. 73-74. The Monophoto was originally
developed in 1949, by George Westover in Britain, as
the Motophoto, but later re-emerged in 1955 as the
Monophoto. (p. 74)

[144]Ibid., p. 76.

[145]Ibid., p. 72.

Intertype, and Linotype linecasting machines in that line slugs and matrices were assembled by cam-release and magazine re-distribution techniques.[146] The actual "casting" of the type however, was replaced by "the substitution of a camera and by the introduction of a somewhat different principle to achieve spacing and line justification."[147] Justification in the Intertype was accomplished through the application of blank mats, which were photographed rather than the old spacebands. Because of this, justification was accomplished by "letterspacing" or adding equal leftover space to each letter, including spaces between letters. Later models, of the Intertype were able to eliminate this deficiency.[148]

The photographic principle of the Intertype operated so that the images photographed were stationary, while the film mechanism moved after being exposed to each image. An elaborate system of lenses and film housing was utilized to mechanize this process.[149] Different size lenses and two pre-sized

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[146]Ibid., p. 73.

[147]Ibid.

[148]Ibid., p. 74.

[149]Ibid.

Fotomats allowed for the setting of type at different point sizes.[150]

The Monophoto typesetter was designed closely upon its predecessor, the Monotype. It also used a paper ribbon, which was justified at the keyboard, and then was used to operate the camera unit. Instead of photographing lines character-by-character, as in the Intertype Fotosetter though, the Monophoto's zoom lens focused on the characters through a series of mirrors and reproduced the image plus added spacing require-ments onto the final surface. This process produced a superior photo image, but still wasn't that much of an improvement over the hot metal Monotype linecaster.[151]

The other first-generation "typesetter," the ATF typesetter was based on the concept of the typewriter rather than the hot metal typesetter. Like the Monotype, it also employed two machines to produce a perforated type, which was justified and then fed into another machine which produced the final version of the type, including interword spaces. The ATF's type-setters which were developed for use in the 1960s were based on an earlier machine, the Friden Justowriter.

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[150]Ibid.

[151]Ibid.

Many of these machines were modified by ATF for use as phototypsetters.[152] ATF modified the Justowriters so that in the second unit, a film carrier was put in place of the platen, and a rotating disk re-placed the striking bars. A light source placed behind the disk caused images of type to be recorded on the film carrier whenever the disk was stopped. Seybold notes that many newspapers were initially acquainted with photocomposition, through the use of these machines (ATF B-8s).[153]

While the use of photocomposition techniques in these first generation machines was indeed a revelation to the printing world, new techniques and machines began to appear almost immediately. In 1946, two French inventors, Louis Moyroud and Rene Higonnet, began the development of a new phototypesetter which ultimately was introduced in the form of the Photon 200, which was brought to the United States in the late 1940s.[154]

The Photon 200 was truly a second generation typesetter, because it no longer relied on the physical structure of the old hot metal typesetting machines but

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[152]Ibid.

[153]Ibid., p. 77.

[154]Ibid.

employed a totally new principle. The Photon 200 still operated in some respects like a direct entry type-setter. However, once the lines had been typed and justified at the keyboard, information was sent electronically through a relay section, to an output unit which accomplished the photo-typesetting.[155] The Photon was also tape driven, giving it a "dual-drive" function. This meant it could also photo-typeset material sent from other sources such as wire services.[156] The Photon was also able to mix point sizes and type faces, and could reach speeds of up to twenty or more characters per second.[157] While this was an improvement on first-generation machines, it was still too slow for the increasing demands of the newspaper industry. Subsequently, the Photon Zip was developed, which could image 500 to 800 characters per second, through the use of individual character flashes, rather than a rotating negative disk, which were caught by a lens which moved back and forth across the film.[158]

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[155]Ibid., p. 78.

[156]Turnbull, p. 103.

[157]Ibid.

[158]Ibid., p. 105.

Second generation machines, as has been mentioned differed from their predecessors in that they made a significant change the technology used. This generation of phototypsetters had as their purpose, the projection of images of photographic masters onto film or photosensitive paper in order to set type.[159] They differed from other later generations, in that typesetting was achieved through the "process of directing a light source through a series of negative images of the desired characters and symbols."[160] Later generations of typesetters altered this process significantly by producing type from secondary images rather than direct exposures.

While the first phototypesetters were introduced in the 1950s, it wasn't until the 1960s that the cold type processes really began to take hold. While less than 200 newspapers in the 1950s were utilizing offset techniques, by 1968, over 5,000 papers were, and, by 1978, probably 94% of the nation's weekly papers, and 72% of it's daily papers were printed using offset techniques.[161] While originally, offset was a separate

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[159]Seybold, p. 84.

[160]Ibid.

[161]Hynds, p. 266.

process from letterpress, with the development of cold

type, the two ultimately became interrelated. The

offset process combined several functions.[162] The

efficiency of such processes had increased to such an

extent by the mid-1970s, that offset presses could

reach speeds of more than 60,000 copies per hour, with

plate life extended to several times the old maximum of

30,000 impressions.[163]

During this period, a third generation of photo-

typesetters began to appear in pressrooms. These

employed the use of a cathode ray tube (CRT) to create

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[162]Hynds, p. 267. Hynds describes a typical offset
process, which often used second-generation photo-
typesetting methods: "The offset printing process
normally begins with the production of cold type by
photocomposition or some other process. The paper type
is placed on a pasteup page the size of a newspaper
page according to instructions from news and
advertising de-partments. Space is blocked out for
negatives of any pictures scheduled for the page, and a
negative of the entire page is made. Picture negatives
are stripped into the page negative and the completed
page is placed on a highly sensitive metal plate. A
powerful arc light is then shined through the openings
in the negatives to burn the images onto the metal.
The plate, which is flexible and can be bent to fit the
curvature of a rotary press, is chemically treated so
that ink will adhere only to the proper places. When
the press is activated the plates pass first by
moistening rollers and then by ink rollers. The ink is
rejected by the water-covered areas but ac-cepted by
the treated image areas. The image is trans-ferred
from the plate to a blanket roller and then to the web
of paper as it passes by the cylinder".

[163]Ibid.

the image of type on a video screen which would then be photographed. These type images once created on the screen could be reduced or enlarged by a system of lenses and then photographed. While this was a somewhat indirect method of producing cold type, its advantages were that it was faster, and the image on the screen could be electronically manipulated. Just as important, the CRT system had less parts internally that might break down.[164] There were two basic types of CRT devices developed. The first type, not commonly used any more, derived character images by scanning a photographic master it had stored on grids, very similar to a second generation machine. As each image was scanned and appeared on the screen, the light from that image passed through a lens and onto photographic film.[165] Later machines store characters as digital representations rather than a photographic master and are much more universal in use. Both types of third generation CRT typesetters generated characters on the "face of a CRT as strokes or dot patterns."[166]

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[164]Seybold, p. 112.

[165]Ibid.

[166]Ibid.

Cost was an important advantage of CRT machines. These machines, introduced in the 1970s were not only more efficient in many respects than their predecessors, they were also significantly less expensive. Such machines also no longer needed the "keyboarding" output of large numbers of personnel, and could offer a wider variety of type sizes in one line, by manipulating the line electronically.[167]

Another generation of typesetting machines has been described, although Seybold notes that at this point, the technology of computers is expanding so rapidly that it is not effective to think of these machines in terms of generations any more. After cathode ray tube technology was introduced, typesetting laser-scanners and fiber optics were also used in newer machines.[168] This technology as well as more advanced versions of third generation machines allow their users to combine ever more sophisticated operations with the basic phototypesetting process. These include microfiche and microfilm creation, as well as the digitization and reproduction of line drawings and half-

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[167]Ibid., p. 135.

[168]Ibid., p. 137.

tones.[169] The digitization of photographs is of
particular concern to newspapers as the reproduction of
photographs in concert with cold type pasteup has
always been problematic. This is one area for which
the development of full page computer makeup, or
pagination holds bright promise, for as computer
technology becomes more advanced so does its ability to
reproduce images.

Page Makeup

Page makeup, or the "arrangement of headlines,
body type, photos, and other elements on a newspaper
page," has varied historically from almost no page
makeup in Ben Franklin's day to increasingly more
sophisticated page makeup in the latter part of the
twentieth century.[170] The earliest papers tended to
have vertical page makeup, where the reader's eye was
drawn from top to bottom of the page. Gibson notes that
the history of page makeup has included many extremes
from no page makeup, to vertical makeup, horizontal
(i.e. headlines more than one column wide), modular (as

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[169]Ibid.

[170]Martin L. Gibson, Editing in the Electronic Era
(Ames, IA: Iowa State University Press, 1979), pp.
208-209.

in magazines) and extremes of these.[171] Vertical page
makeup has basically remained the style for newspaper
layout, although horizontal makeups are frequently
added. Horizontal and vertical are the two most common
page makeup terms applied to newspapers, although
Gibson notes that tabloid publications employ a
slightly different philosophy, in that they are roughly
half the size of regular broadsheet publications, are
printed sideways like regular newspapers, but usually
have nothing on page one except a "nameplate and a
giant headline, with a reference to a story inside or
perhaps a picture and a slightly smaller headline."[172]

Page makeup accomplishes several functions in-
cluding grading the news as to importance and increas-
ing the newspaper's appeal to its readership.[173] The
main function of page makeup is to "grade" the news.
Effective page makeup will tell the reader which
stories are the most important and then "subtly cate-
gorizes all other stories on each page."[174] Makeup
also ranks stories in the current day's paper against

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[171]Ibid.

[172]Ibid., p. 210.

[173]Ibid.

[174]Ibid., p. 215.

previous days. As Gibson describes: "Readers are seldom aware of it, but newspapers perform a continuous symphony of ideas as headline sizes go up and down and 1italic heads team up with round-cornered boxes and underlines and kickers and railroad gothics to show how today's news is different from yesterday's."[175] All this accounts for a substantial amount of cost in man-power and paste up time that could conceivably be accomplished, and in fact has been accomplished recently with the advent of pagination, the development of which is the subject of the next chapter.

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[175]Ibid.

CHAPTER III

PAGINATION: THE NEXT STEPS

The introduction and evolution of electronic
partial and full-page pagination systems in the
daily newspaper industry in the United State
during the early 1970s.

Introduction

While the development in the 1940s and 1950s, of

phototypesetting machines which no longer required the

casting of metal type was a significant achievement,

this was only the beginning of a series of developments

which would utterly alter the face of printing as a

whole and daily newspapers in particular. The intro-

duction of second generation typesetters and beyond,

began to be accompanied by front end systems which now

used computer concepts rather than the old direct

keyboarding of characters into the system as they were

being set. The use of video display terminals, and the

ability to store data in banks heralded the beginning

of a new idea in the production process: that control

of the production process should naturally flow from the editor, writer or graphic artist who created and inputted the original material.

In the 1960s and early 1970s, input technology continued to become more and more sophisticated, in concert with the development of increasingly efficient phototypesetters, relying on cathode ray tubes or laser-imaging, for the production of images to be photographed into type. The development of techniques such as optical character recognition (OCR) and the replacement of paper transfer tapes with magnetic tapes and floppy disks, allowed copy to be flowed at ever faster rates, from computer keyboard to phototypeset galleys.

A major problem remained, in terms of time and efficiency, though, for the publishers of daily newspapers, and weekly magazines in the 1970s. Once the type was photoset, it still had to be made up into pages by hand. This was a time-consuming process, especially when it came to the fitting of extra lines or words (widows), or the cropping in of photographs, which in themselves could mean several hours of valuable time spent. Another problem entirely was the composition and production of advertising pages, both classified and display ads.

It was the need to find solutions to these production problems which helped speed up the advent of computerized pagemakeup. In the mid-1970s, systems began to appear in the industry which could accomplish partial or even complete electronic pagination of running text. However printers still had the problem of integrating graphics and photography, not to mention classified and display advertising. Most large newspaper and magazine publishers solved these latter problems through the use of entirely separate systems, which were costly and limited in their applications. It was the advent of the personal computer which finally opened the door to the publisher's dream; interactive systems which could mainly or even completely do away with manual pagemakeup, including more recently, photography and graphics, and could also integrate classified and display advertising through the use of multiple-user workstations. The ultimate end to all this was to be the complete computer production of entire pages of newspapers called direct computer-to-plate production, processes which are still being perfected in the late 1980s.

Input: Catching Up to Computerized Photocomposition

The first new typesetting machines, introduced in

quantity in the 1950s and 1960s, required operation by highly trained keyboarders, familiar with machine codes, and who knew how to make "line-ending decisions."[177] Later, in the 1960s, the front end processes of newspaper printing began to witness the introduction of computer concepts to aid typesetting. These early computers took in coded input, usually on paper tapes, and analyzed this information in order to produce justified text in various type formats.[178] Occasionally, it was possible to arrange the output of these early computers into complete pages with windows for photographs. Mostly though, the data was output into galley form which had to be cut and pasted into a page layout.[179]

The introduction and widespread use of video display terminals in the early 1970s was heralded as the most important advance since the introduction of the digital computer in the 1960s because of the possibilities for increased flexibility their use

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[177]Seybold, p. 358.

[178]Seybold, p. 359.

[179]Ibid.

offered.[180] These early video display terminals used various types of memory to generate images including a delay line, magnetic drum, or core memory, which allowed the image to be produced on the screen at the same time as other processes were being accomplished.[181]

The use of video display terminals and optical character recognition (OCR) scanners began to pick up very quickly after their introduction in the early 1970s as viable production tools. This was a natural development, seeing that by 1972, almost 2,000 photo-composition machines were in use by ANPA member news-papers.[182] Romano noted that only three years after its introduction into the industry, OCR scanning was already being used for more and more aspects of the production process, including scanning copy at speeds of up to 1,500 words per minute, with the capability of producing varied types of output.[183]

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[180]Jules S. Terlow, "Display Terminals - 'Turned On' in the 70s", ANPA Research Institute R.I. Bulletin, April 22, 1970, p. 125.

[181]Ibid., p. 126.

[182]Peter Romano, "Rapid Pace Marks Newspaper Technology's Recent Evolution," ANPA Research Institute Bulletin, July 27, 1973, p. 158.

[183]Romano, p. 160.

The interest of newspapers in OCR devices was noted in the conversion of one mid-size daily, the (Iowa) "Waterloo Courier," from hot type to cold type in just one month, using both video display terminals to create stored copy, and OCR scanners to convert hard copy received from wire services. The "Courier" was able to accomplish this transition smoothly, without any late editions.[184] The introduction of new computer technology into the industry prompted another daily, the (Montgomery, Alabama) Advertiser and Journal to change its letterpress, over to cold type as a matter of survival. Using a classified ad program developed by Digital Equipment Corporation, the newspaper incorporated this technology, as well as OCRs and VDTs into its new system.[185]

Faster information retrieval, as well as automatic indexing of information and cataloguing were other features that the new computerized typesetters could offer.[186] Introduction of the video display terminal

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[184]"Paper completes switch to cold type in one month", Editor & Publisher, December 8, 1971, p. 31.

[185]"Going tapeless in alabama: A matter of survival to dailies," Editor & Publisher, June 9, 1972, p. 62.

[186]Richard C. Steele, Computers, Cathode Ray Tubes and What Next?" ANPA Research Institute Bulletin, May 12, 1970, p. 142.

also prompted industry experts to predict that "fully integrated work systems" would be forthcoming.[187]

Early computerized typesetting systems had several disadvantages. For one, while the slower typesetting devices could often make independent line-ending and justification decisions, and thus were not truly "slaves" to the input unit, they generally did act as slaves, and the faster systems were, in fact, slave systems, unless their manufacturers had provided the user with sophisticated logic programs to overcome this effect.[188],[189]

Early programs for typesetters were ordinarily designed for mid-size mainframe computers, and were generally operated in a dedicated environment, separate from other business functions such as payroll, or data management. While a few integrated programs were developed for such purposes, computer manufacturers were not generally successful in the development of "effi-

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[187]Stanton R. Cook, "The Newspaper of Tomorrow, Which is Here Today," ANPA Research Institute Bulletin, Sepember 29, 1970, p. 419.

[188]Seybold, p. 359.

[189]L. G. Heath and Ian Faux, Introductory Phototypesetting (Pittsburgh, PA: Graphic Arts Technical Foundation, 1980), p. 204, define "slave" as: "Any device that is driven by a computer's output, either on-or off-line".

cient composition programs capable of being run under a time-shared or multi-processing environment along with other tasks, such as payroll, accounts receivable or even text-management systems."[190] This meant that ultimately, by the early 1970s most computerized text composition programs were run off mini computers. The most popular of these systems were: the Digital Equipment's PDP-8, and Data General's Nova, and later the DEC PDP-11.[191] At this time, while typesetter manufacturers did not create software packages for composition but only sold the hardware, they did start to manufacture "direct-entry" typesetting devices for smaller operations. On these machines, the keyboard operator made the line-ending decision, or ran a semi-automatic process, which included simple hyphenation logic.[192]

It soon became obvious though, that these systems needed to be able to proofread, edit and update information which was still in the data banks. "Multiple-pass" programs were designed to incorporate

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[190]Seybold, p. 359.

[191]Ibid.

[192]Ibid.

corrections, but were yet awkward and slow.[193]

The early 1970s saw the introduction of video terminals which began as output support, and developed into input terminals for editors and writers. With the solution of external labor conflicts concerning the production of work, the way was being quickly paved for the transfer of copy directly into the typesetting system.[194]

Of the specific programs which were developed to handle the needs of newspapers, one of the more important was that which integrated classified advertisements. These programs allowed data to be input into the system directly from the phone-order. This information, keyboarded in by an ad-taker, could be sorted for all the significant placement and billing information needed, as well as be actually composed while the ad-taker was keyboarding it into the system.[195] Early in 1974, the ANPA Research Institute announced their CLASS-11 system meant to be used with DEC's PDP-11 computer. The systems purported to store up to ten separate classified sections, with the

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[193]ibid.

[194]Ibid., p. 360.

[195]Ibid.

ability to sort ads in different ways within variable classifications, with a minimum of keystrokes required for inputting. The system also stored old information for regeneration, allowed for line corrections and VDT editing and supposedly worked with any hyphenating and justifying phototypesetter using a six-level TTS input.[196]

Even as late as 1970, the advantages of cold type production were being compared to the old hot metal processes, for the production of classified advertising.[197] Less than a year later, computerized classified ad systems were being introduced into the industry which considerably simplified the process of creating this type of advertising, even though they were not integrated with other pre-page makeup processes.[198] Also described at the same time were other "electronic tools" for the more efficient production of newspapers including the optical character recognition (OCR) scanner, and the video

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[196]"ANPA/RI Offers Software System for Classified Production," ANPA Research Institute Bulletin, February 6, 1974, pp. 30-31.

[197]Erwin Jaffe, "Zap Takes Time," ANPA Research Institute Bulletin, October 6, 1970, p. 429.

[198]Erwin Jaffe, "Comprehensive Classified Ad Computer System Developed by ANPA/RI Research Center:, ANPA Research Institute Bulletin, March 1, 1971, p. 21.

display terminal. These elements, along with the classified ad system were discussed as elements in the newsroom "subsystems" which comprised the state of the art technology in newsrooms of the early 1970s.[199]

The joint efforts of Honeywell Information Systems and Pacific Press in 1973, produced a classified ad system that was capable of producing complete pages of classified ads or "pagination" as they termed it. The idea was to produce large blocks of photocomposed type for easier page makeup. This was accomplished by the storage of information on magnetic tape, including type size and depth instructions. These were then sent to a Linotron 505 Phototypesetter and produced as a four-column wide photographic proof which was ultimately cut into strips for manual pasteup.[200]

While it was the needs of North American newspapers, which generated the impetus behind the development of computerized input-output systems in the 1970s, there were developments in the magazine industry, which also were important, because they

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[199]Jules Terlow, "Electronic EXTRAS for Tomorrow's Newspaper - Today!" ANPA Research Institute Bulletin, May 24, 1971, p. 63.

[200]Peter Y. Southam, "Computer at Pacific Press Produces Classified Blocks", ANPA Research Institute Bulletin, August 20, 1973, pp. 218-219.

foreshadowed advances that would take place in the following decade. One publication, U.S. News & World Report, used a system developed by Atex, which focused on copy-fitting and input, but also experimented with pagination and satellite remote-transmission to printing plants. These initial programs led to the later development of programs which were able to produce line drawings and halftones, already in place with text, when the final page was output.[201] Atex also had its equipment installed at Newsweek, and the Reader's Digest, among other places. New York Newsday, a Long Island-based daily ordered an unprecedented 224 VDTs from Atex for its operations.[202]

The problems presented by the composition of display advertising were also a challenge for news-papers and other publishers. A portion of these ads were produced by advertising agencies, but the largest proportion of them were produced by the newspapers themselves.[203] These complicated proceses were mostly handled by separate systems from the ones which produced copy galleys, because the ads could be

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[201]Seybold, p. 360.

[202]"Newsday orders 224 VDTs, 13 computers, from Atex", Editor & Publisher, November 16, 1974.

[203]Seybold, p. 361.

integrated later into the copy, during the manual page makeup process.[204]

It was the need to integrate these processes, typesetting, and display ad setting, as well as classified ad production, that helped create the Newspaper Systems Development Group, an industry financed effort which produced the first integrated area composition systems, in the form of "interactive terminal workstations."[205] The Newspaper Systems Development Group (NSDG), had something of a model in the Japanese newspaper Asahi Shimbun, which contracted IBM several years earlier to develop an interactive page makeup system for the Japanese paper.[206] These workstations permitted trained keyboard operators to follow prepared layouts which contained copy and de-signed ads, which had been pre-designed and integrate their layout with already inputted text on the computer screen. These workstations also permitted the operator to manipulate elements on the page including type

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[204]Ibid.

[205]Ibid.

[206]Dave Davis, "Prices always come back", The Seybold Report, May 26, 1975, p. 9 (reprinted from U.S. News & World Report, 1974).

size.[207] In this manner, partial electronic pagination was achieved.

The ANPA Research Institute reported that the lack of agreement on the basic components of pagination systems was responsible for the length of time it was taking to develop them. One approach described was that of the NSDG, a group of eight newspapers which had been working for four years to produce an integrated system for full page composition. The ANPA lamented NSDG's approach to the development of pagination noting that it precluded use as yet by other non-NSDG properties, and required expensive acquisitions to install. NSDG representatives noted that they had a close relationship with IBM, which arose out of the work that IBM's Federal Systems Division had done for the Japanese.[208] The view of the NSDG, which was to later be incorporated intimately into the development of electronic pagination, was that the best way to produce a full newspaper page, was to assemble all its elements including graphics and photographs in one "interactive system". This they proposed would require

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[207]Seybold, p. 361.

[208]Paul A. Tattersall, Directions of Full-page Composition - Newspaper Systems Development Group," ANPA Research Institute Bulletin, August 20, 1975, p. 211.

the online storage of 1 billion characters or more, and
high speed photocomposers that "can produce an entire
page every 2 or 3 minutes".[209]

The NSDG wasn't the only group racing to produce
pagination systems during this period. Media General,
Inc. and Mead Corporation also launched a program
parallel to the NSDG's, in which copy would be sent to
computer storage via OCR or VDT units. Graphic
material would be scanned by a laser for conversion
into bits of information which could later be recom-
posed along with the type into a full page plate
negative.[210] Also citing the NSDG project, the New York
Daily News announced its own plans to develop a pagin-
ation system in 1975.[211]

It wasn't only the giants in the newspaper in-
dustry who were concerned with finding more cost-
efficient ways to operate production. In fact, smaller
papers were often the first to think about implementing
new technology. To this end Harris Systems introduced
the "Harris 2500 Model 20", in 1974, designed

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[209]Ibid.

[210]"Joint effort announced for pagination system,"
Editor & Publisher, January 11, 1975, p. 32.

[211]"N.Y. Daily News moves toward integrated
publishing system," Editor & Publisher, January 11,
1975, p. 30.

especially for newspapers with circulations of less than 50,000. This economical copy input system used video typewriters and allowed smaller newspapers to have on/line input properties.[212]

Floppy disc technology was also being used in 1974, specifically in classified programs for smaller newspapers, like the CompuScan system. These systems were used specifically because they eliminated the need to have large mainframe computers, and were relatively inexpensive ($31,000 for the CompuScan program described) for that period.[213]

Two competing Canadian dailies implemented early pagination systems to handle classified ads in 1974. Using a computer and photo-typesetting techniques to generate classified pages, these newspapers maintained certain style differences with the use of predesigned OCR scanning forms for input. The two papers, the Vancouver Province, and the Vancouver Sun, have large circulations of 132,000 and 262,000 respectively, and were integrating a CompuScan 170 subsystem into the overall computer system at Pacific Press which

[212]"Low cost front end system introduced", Editor & Publisher, June 15, 1974, p. 24.

[213]"Floppy discs used for classified storage," Editor & Publisher, June 15, 1974, p. 40.

publishes the two newspapers by August, 1974. The
pagination system was able to generate space blocks for
display ads, as well as column copy for classified
liner ads in half-page strips, which simplified the
paste down process.[214]

The Alexandria (LA) Daily Town Talk implemented a
new computerized classified ad system in 1974, which
was also in field test use at the Marion (IN) Chronicle
Tribune and the Lafayette (IN) Journal and Courier.
The system, called LAYOUT-8, automatically positioned
display advertising on page dummies which are printed
out by computer. Run on a PDP-8 computer (DEC) this
program allowed the programmer to produce multiple-
zoned editions having regional advertising in some
editions but not others. It also allowed to operator
to run quick trial runs for news layout, showing in
minutes, the effect of adding or subtracting pages from
an edition.[215]

With the announcement of the NSDG's research
efforts, interactive page makeup became the focus of
attention in the newspaper industry. The Minneapolis

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[214]"Page make-up achieved by 2 four-column output,"
Editor & Publisher, August 10, 1974, p. 27.

[215]"Automatic display ad dummying with LAYOUT-8,"
ANPA Research Institute Bulletin, September 2, 1975,
pp. 231-235.

Star and Tribune Company, which was one of the eight

newspapers participating in the NSDG project reviewed

its experiences with the RAYCOMP-100 system, an

interactive full page ad composition system, which

Raytheon Company of Boston had manufactured. The

newspapers were using the RAYCOMP-100 as an interim

system while they participated in the production of a

more comprehensive system. They noted that they had

achieved a 40% overall time savings by using the

RAYCOMP-100 system instead of manual display ad page

makeup techniques.[216]

Subsequent to the announcement of NSDG efforts,

many newspapers began to plan for pagination. The

Orlando (FL) Sentinel Star, announced its entry into

complete cold type production with the planned

installation of an integrated classified ad system.[217]

Brown University launched its own pagination research

project, the Brown University Newspaper Pagination and

Production System (BUNPAPS) which employed contrasting

techniques to the NSDG work. BUNPAPS asserted that the

most efficient pagination system would need to create a

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[216]William Shalko, "RAYCOMP: An interactive
composition system," ANPA Research Institute Bulletin,
November 26, 1976, pp. 507, 514.

[217]"Classified order system to cut costs," Editor &
Publisher, November 13, 1976, p. 56.

realistic looking "page dummy" on the VDT, because of the complexity of elements inside a page.[218] Similarly, the Toronto Globe and Mail, gave a grant to the University of Toronto's Dynamic Graphics Project to help in the development of a prototype interactive graphics pagination system, called NEWSWHOLE.[219]

Another ANPA research program developed at Massachusetts Institute of Technology (MIT) in 1975, allowed computers to not only dummy the classified ad pages, but actually lay them out in final form. In a field test at the Boston Globe, a computer-driven ad layout system placed 90 of 92 ads in one edition in 15 minutes. Previously it had taken layout men 3 hours to accomplish a similar task. The research department at MIT also noted that it was in the process of developing the complement to the classified ad program, a computer-driven news-layout program. They weren't sure when the new system would be ready, noting that it had taken six years to develop the ad-layout system, but

[218]Hans Andersin, "Pagination research points up contrasting techniques," Editor & Publisher, April 17, 1976.

[219]"Interactive pagination system announced," Editor & Publisher, June 5, 1976.

they felt that the programs could ultimately run on a minicomputer.[220]

Harris Corporation noted the effect that computerization was having on their company in 1976 by reporting that all sales of newspaper electronic copy processing systems, would reach $60 million by the end of 1976, double the previous year's figure, and $90 million by the end of 1977. The one-time manufacturers of the Harris Intertype hot metal linecaster, now offered computerized systems to larger newspapers (including The New York Times and the New York Post), which included pagination features.[221] As expected, their original competitor, Mergenthaler Linotype Company, also announced the introduction of a pagination system, called Page View Terminal, which would allow the interaction of text and graphics.[222]

The Camex 135 was another early ad and page layout system which showed a display area one quarter the size of a full newspaper page, with a limit of 5,000

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[220]Roland Parenteau, "Computer program puts ads in paper in minutes," Editor & Publisher, April 5, 1975, p. 13.

[221]"Copy systems market expected to hit $90 million," Editor & Publisher, June 5, 1976, p. 38.

[222]Earl W. Wilken, "Pagination system shown," Editor & Publisher, June 12, 1976, p. 25.

character display, and the ability to manipulate facsimiles of the actual graphics. Future systems were promised to have page makeup abilities as well as "faithful rendering of halftones." [223]

Even though the abilities of these area composition workstations was pretty limited, they still attracted significant attention in the industry.[224] The display of material on the computer screen for the composition of graphic ads was crude, but it gave the operator an immediate idea of what the final product would look like. Some programs even allowed the printout of these images onto plain paper for further manipulation.[225]

The Minneapolis Star and Tribune used the RAYCOMP-100 system, an "interactive full-page ad composition system. These papers were one segment of the eight member group that formed the Newspaper Systems Development Group (NSDG) to develop a full page

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[223]"The Camex Ad and Page Layout System," The Seybold Report, May 26, 1975, p. 10.

[224]Seybold, p. 361. Seybold notes that the early interactive terminals were "quite limited in their functionality in the sense that the amount of copy that could be formatted in one 'take', tended to be relatively small (equivalent to that of a 'busy' full-page newspaper grocery ad)".

[225]Ibid.

composition system, in conjunction with IBM.
RAYCOMP-100 was being used by the Star and Tribune as
an interim stand alone system to handle display
advertising. By computer-composition of the ads, the
papers indicated that they had experienced substantial
savings in some areas of production, especially mark-up
(80 percent reduction) and paste-up (52 percent
reduction).[226]

In 1976, The New York Post began its shift from
hot metal to cold type production, with the purchase of
a Model 2550 copy processing from Harris Corp. The new
system allowed editorial copy to be entered via two OCR
scanners once it had been converted to scannable for-
mat. The new system also installed six video display
terminals initially and added five incoming wire lines.
The Harris system was hooked up to three photo-
typesetters which could operate simultaneously. The
paper, which had a 505,757 circulation at that point
also planned to install a classified ad system sometime
in 1977.[227]

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[226]William Skalko, "RAYCOMP: An Interactive
Composition System," ANPA Research Institute Bulletin,
November 26, 1976, pp. 507-514.

[227]"New York Post to install electronic system,"
Editor & Publisher, September 4, 1976, p. 28.

The New York Times, already using three Harris
2200 electronic composition systems for its display
advertising, announced in 1976, that it would be
purchasing additional equipment from Harris to convert
its editorial functions from hot metal to cold type
composition, beginning the following summer with
certain Sunday sections and graduating to include main
news sections later.[228]

Similarly, The Washington Post installed a Harris
2500/20 front end system that had 22 VDTs utilized for
processing copy for some of its sections.[229]

Other papers were also noting their progress with
electronic composition in 1976. The Mason City (IA)
Globe Gazette reported a $30,000 net savings per year
with their Harris 2520 copy processing system, which
included 11 VDTs. They noted that their costs for
man-hours-per-page had dropped from roughly $20 to
about $10. The Mason City paper also noted that since
labor costs had been close to $30 per page some four
years earlier, the combination of cold-type production

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[228]"N.Y. Times places order with Harris for VDTs,"
Editor & Publisher, February 21, 1976, p. 13.

[229]"Front end System at Washington Post," Editor &
Publisher, February 21, 1976.

and electronic editing had saved the paper some $200,000 per year in wages and benefits.[230]

While the newspaper industry moved ahead into the computer age and the era of computer-assisted cold type composition, the NSDG group continued its efforts to develop a completely computerized full-page pagination system. Representatives from the Minneapolis company publishing their Star and Tribune announced in 1976 that Minneapolis would be the location for the NSDG's pilot project. It was predicted that the pilot project using full page pagination would begin sometime in 1977, and would be fully operational by June 1978.[231] Later in 1976, the NSDG group announced that their pagination test project was proceeding on schedule, at another location outside of Gaithersburg, MD. Dwight Brown, general manager and spokesman for the development group indicated that the purpose of the project was to not only "to produce today's newspapers with management having total control of their content and makeup, but to be ready to service the media of tomorrow, whether the product be transmitted by

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[230]"System produces $30,000 net savings per year," Editor & Publisher, September 11,1976, p. 30.

[231]"Minneapolis gets composition site," Editor & Publisher, January 17, 1976, p. 21.

satellite or by wire for reading on home television screens."[232]

With the impetus of area composition, systems began to be developed which offered users the opportunity to preview representative output on screens, or as actual pseudo-typeset images. One of these early systems was the Dymo Graphic System which incorporated a glass "plasma" display screen for the soft-copy previewing of text, in the mid-1970s.[233] While these advances still necessitated going back into data files for correction, because they were not interactive, they were nevertheless, an important development.

One large newspaper to employ the Dymo Graphic system, was the National Enquirer, who deployed the new system in place of its old hot metal processes. The Enquirer planned to make use of two Graphic Display Terminals (GDT), and two Video Display Terminals (VDT) to produce its weekly newshole of 34,000 lines plus illustrations.[234]

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[232]I. William Hill, "Pagination test project proceeding on schedule," Editor & Publisher, July 31, 1976, p. 20.

[233]Ibid.

[234]"Soft copy previews aid tabloid in page makeup," Editor & Publisher, June 3, 1978, p. 24.

Shortly afterward, dual preview terminals began to
be developed, which could both show the formatted text
and provide access to the file for editing.[235] Systems
such as Compugraphic and Information International, and
Autologic allowed the user to not only preview for-
matted text, but to also call up type characters from
font storage in the CRT typesetter. As other manu-
facturers began to follow this lead, systems began to
become even more interactive, demonstrating the ability
to combine digitized graphics with character
representation on the CRT screen.[236]
The first truly interactive composition system was
developed in the mid-1970s by the Bedford Computer
Company, in New Hampshire. Other companies had offered
varying degrees of interactivity prior to this point,
such as Imlac and Atex, who gave their users the
ability to redesign selected blocks of copy. But these
developments were hampered by the fact that it was
difficult to design the complicated software needed to
facilitate operator mobility within a text file, as
well as being able to view immediately the results of

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[235]Seybold, p. 361.

[236]Ibid.

corrections and how a story or copy block would appear as a final product.[237]

So even with the introduction of interactive systems, the limitations of software made composition still pretty much a "sequential process". Another problem for systems users at this time, was the cost of the hardware for a multi-user system. Still the advantages of providing such an environment were apparent. The concept of production control began to shift toward the editors and writers as integrative technology was updated.[238] This was seen as natural and desirable in the high pressure, deadline oriented daily newspaper and weekly magazine industries, which had to increasingly compete with television. The impact of the video image was apparent in much of NSDG's and other project's research which all were striving to perfect technology which would allow graphics and texts to be easily combined in one system without manual page makeup. It was along these lines that NSDG announced that it was developing a graphic scanner with the help of Autologic, Inc., which would read graphic material from a read-platen, for storage or direct transfer to a

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[237]Ibid.

[238]Ibid.

photographic plate.[239] Another development group, the SNPA also examined the impact of interactive technology which had signalled the death of IBM selectric type-writers and even OCR scanners as obsolete, even though many newspapers would continue to use them for some time to come.[240]

As has been noted, the newspaper industry's tendency towards the use of smaller rather than larger computer systems ultimately figured importantly in the application of personal computer technology to the business world particularly, printing. A precursor to this newest revolution, was the Harris Corporation's manufacture of small computer composition systems, suitable for smaller newspapers. Harris's goal, with the introduction of the Harris Model 2530 system in 1977 was to allow small newspapers to be able to make use of the technology that was currently only available to the largest newspapers. The Harris systems allowed

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[239]"An update on pagination systems," Editor & Publisher, November 13, 1976, p. 58.

[240]"ANPA workshop examines new technology impact," Editor & Publisher, November 13, 1976, p. 52.

for up to 40 workstations and operated on on-line connections to one or more phototypesetters. [241]

The drive to develop pagination was not without its drawbacks. For one thing, the development of photographic transmission technology seemed to develop very slowly, and this aspect was criticized by production managers who had been expecting full pagination by the late 1970s. The complexity of breaking down pictures into millions of digital bits prompted many to wonder if this aspect of page makeup wouldn't better be left done manually.[242] Earlier in that same year, NSDG had terminated its pagination project with IBM, citing excessive costs relating to the development of the Autologic scanner as the main reason for the termination of the project.[243]

Even with the termination of the NSDG project, the impetus on the development of pagination continued, with the development of new technology. Douglas Sciences Corporation developed the Advertising

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[241]Carla Marie Rupp, "Harris makes computers affordable to small papers," Editor & Publisher, October 22, 1977, p. 12.

[242]Gerald B. Healey, "Photo transmission hit by production managers," Editor & Publisher, September 10, 1977, p. 26.

[243]Earl Wilken, "Full page composition project terminated at IBM," Editor & Publisher, January 8, 1977, p. 9.

Information Data System (AIDS) to help with the production of display ads using hand-held wands to read bar codes on the physical material being produced. This helped track the elements of the ad as it was being produced.[244] Another pagination aid developed, was the DUMMY program which built electronic page dummies in the computer that differentiated text areas symbolically.[245]

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[244]"AIDS system interfaces with pagination concept," Editor & Publisher, August 13, 1977, p. 41.

[245]Richard E. Palmer, "Dummy program aids pagaination drive," Editor & Publisher, November 12, 1977, p. 51.

CHAPTER IV

PAGINATION: THE LATE 1970s AND EARLY 1980s

(The continuing development of pagination
processes after 1977: problems and progress.)

Introduction

The termination of the NSDG project was accom-
panied by other negative harbingers, for the developers
of electronic pagination. Newspapers began to wonder
aloud whether the new systems were cost effective, and
complained at the high cost of the new equipment.
Complete computer-to-plate pagination was still a dream
that hadn't been realized, and most felt that this was
a goal that was many years in the future, despite early
promises by systems developers. Despite the mounting
pessimism though, advances continued to be made es-
pecially in the area of increased computer memory and
advanced graphics capability, which would ultimately
bring the goal of complete pagination much closer to
realization.

Discussion

Cost concerns became a bigger issue in 1977, in the newspaper industry. During an annual ANPA/RI Production Management Conference, representatives discussed their concerns over making electronic editing and pagination cost efficient. Many companies who had purchased front-end systems were concerned that total pagination systems would not deliver as quick a payback on their investment as the front-end systems had. Others insisted that because "newspapers today are truly competing for their reader's available time...[t]he faster we can process information...the more important...newspapers will be to...readers."[246]

The concern over cost-justification in the industry brought on speculation that such thinking might prove sufficiently narrow-minded to stifle the development of a "Total Systems Approach." Experts argued that expecting future systems to offer as quick a payback as current front-end systems was at least part of the cause for the newspaper industry's current

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[246]Earl Wilken, "Quick payback from front end systems," Editor & Publisher, June 25, 1977, p. 22.

reluctance to embrace some of the more sophisticated electronics and software.[247]

At the other end of the cost spectrum, Harris offered its Model 2230 in 1977, a video layout system, which could save low volume newspapers up to 60% of the costs of producing display ads. The system practically eliminated the expensive error-correction cycle, and allowed operators to horizontally and vertically fit ads on the screen.[248]

The Los Angeles Times joined other newspapers who implemented classified pagination, by announcing in 1977 that it had the capability to fully paginate its daily nine-column page classified sections which ran an average of 24 full-run pages. The current practice at that time was to photocompose the classified pages, "leaving holes for banners, promotional materials and display ads, or logos not yet filed in the system." The paper's computer publishing uses software developed to run on an IBM 370/158. Besides speed and accuracy, the

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[247]Earl Wilken, "Cost justification: is industry in a psychological box?" Editor & Publisher, June 11, 1977, p. 48.

[248]"Layout system made for low volume papers," Editor & Publisher, June 11, 1977, p. 96.

system was touted as offering design flexibility also.[249]

The Associated Press broke new ground in 1977 by announcing that it would begin implementing an "electronic darkroom," shortly. Although not yet capable of completely integrating graphics and text, the new AP system was nevertheless an important advance which gave a strong rebuttal to industry critics of the total systems approach. The digital darkroom allowed the reception and transmission of pictures from anywhere in the world, as well as the storage of those pictures in digital form. Later, the pictures could be altered on a video screen, enlarged, reduced, cropped, or even changed in picture quality.[250]

In 1978, the technology underlying the digital reproductions of half-tones began to pick up. However the process was still too complex and expensive for most printers to use, except for specialized applications like the remote satellite transmission pro-

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[249]"L.A. Times develops fully paginated classified system," Editor & Publisher, June 11, 1977, p. 34.

[250]"AP's digital darkroom breaks new ground," Editor & Publisher, June 11, 1977, p. 15.

cedures used by <u>U.S. News & World Report</u>,[251] One system
that was set up to carry out half-tone resolution from
video display terminals was the VideoComp 570 accom-
panied by the Model 3600 Illustration Scanner. This
system was originally developed and then dumped by
RCA, to be rescued by Information International.[252] In
addition to an illustration scanner, the system also
had a page layout option, The 2000 Page Layout
System.

The Arrival of the Personal Computer

The concept that input persons, such as writers,
editors, graphic artists and designers, might be more
involved in the production process than was tradi-
tionally accepted, was especially helped by the advent
of the personal computer, especially in the late 1970s
and early 1980s.[253] Personal computers, initially began
to appear in the early to mid-1970s, with products such
as the Altair 8800 in 1974, and then other machines

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[251]"Reform of the CIA - what it really boils down
to," <u>The Seybold Report</u>, March 27, 1978, pp. 8, 11,
12.

[252]"Incorporating graphics into the scheme of
things," <u>The Seybold Report</u>, August 25,1980, pp. 1, 3,
11.

[253]<u>Ibid</u>.

developed by Apple, Tandy/Radio Shack, and Commodore. These machines were initially sold to amateur operators for hobby use, but with the advent of the Visi-Calc System in 1979, the applications possibilities of personal computers for the business world began to become increasingly apparent.[254]

As the quest for updated front-end technology heated up, phototypesetters continued to be improved also. In 1979, improvements in laser efficiency, made fifth-generation laser typesetters increasingly more affordable. Different types of lasers, including the helium neon laser, the visible ion laser, and the carbon dioxide laser, all were analyzed as having possible applications in the publishing industry.[255]

Mergenthaler made its bow into the area of laser technology, with the Omnitech/2000, a fifth-generation laser typesetter. The machine employed the beam of a 2 milliwatt helium neon coherent laser, which could set type at 35 square inches per minute regardless of point

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[254]Seybold, p. 365.

[255]Henry E. Gauthier, "Recent developments - UV laser technology", _Editor & Publisher_, November 10, 1979, p. 70.

size. The machine also used floppy disk technology to store information about type sizes.[256]

The Washington Post ordered a total of eight laser platemaking typesetters, from EOCOM Corp. The paper, which is one of the largest in the country, ordered the equipment to augment its plans to build a satellite printing plant in a Springfield,Virginia location 11 miles from the main plant. The new system would allow the paper to produce plates simultaneously at both plants, allowing for quicker production and delivery of the paper overall.[257]

In the printing world, however, and especially concerning newspapers, the trend was still towards integrating full page composition systems into mini computers, which were still only one step below the cumbersome mainframes of the previous decade. Still the promise of new and exciting technology abounded with the start of the current decade. In 1980, it was reported that the generation of color halftones would soon become a commercial reality with the perfection of

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[256]"5th generation laser typesetter bows", Editor & Publisher, December 1, 1979, p. 42.

[257]"Washington Post buys 8 laser plate units", Editor & Publisher, November 10, 1979, p. 52.

systems like the VideoComp 570.[258] And in 1979, the

coming of micro-computers was heralded by the the ANPA

Research Institute as a likely event in the near

future.[259] In 1981, the development of pagination was

still problematic.[260]

The early personal computers had the disadvantage

of being difficult for the non-initiated to operate and

the call for machines that were "user-friendly"

heralded the development of one system in particular,

the Star, by Xerox Corporation. The Star, introduced

in 1981, was derived from an earlier experimental

system, the Alto, originally developed to show how

personal computers could handle the demands of tasks

traditionally relegated to main frames.[261] Developed

from its self-contained predecessor, the Star had

graphics capabilities, a 10 1/2 x 13 1/2 bit-mapped

monitor (able to show at 96% of true size, the print

area of two 8 1/2" by 11" pages, placed side by side),

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[258]Dr. Joseph E. Rowe, "Newspapers and technology, thrust toward tomorrow," ANPA Research Institute Bulletin, September 26, 1979, p. 318.

[259]Ibid.

[260]"Page makeup: no single solution," The Seybold Report, February 9, 1981, p. 1.

[261]Ibid.

and a mouse.[262] This machine was able to display various type sizes as a function of its working mode, and could also perform basic page makeup tasks, including the incorporation of graphics, bar charts, line drawings and space for illustrations. This machine, in concert with the earlier introduction of Xerox's 9700, an electronic xerographic printer, which was also to be used as a collater, typesetter and press, were significant introductions into the printing world, even though the Star wasn't able to actually "drive" the 9700. Later, Apple introduced the Lisa computer in 1983, and the Macintosh in 1984 based on the concepts inherent in the Star.[263]

In the newspaper industry, the technology which would ultimately be embodied in complete pagination was picking up in 1981, even though industry forecasters felt that publishers were being much more cautious than they had been a decade ago, when they abandoned hot metal processes for newer technologies like video display terminals and optical character recognition scanners. Systems developed by Hastech and Information International Inc., were announced as the first to ac-

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[262]Ibid.

[263]Ibid.

tually integrate all aspects of production into a pagination system.[264] The creation of "electronic pagination", although not yet widely used, was predicted to spread rapidly to other systems. One report predicted more than $1 billion in pagination equipment sales by 1986.[265]

Gannett's Westchester Rockland Newspapers announced that it had a sophisticated interactive full-page pagination system (without graphics) in operation as of early 1981. Using the Hastech PagePro pagination system, the beginning of production here, "marked the beginning of an era in the newspaper industry that portends economic savings in page makeup and greater flexibility in meeting the informational demands now and in the future of newspaper readers."[266] At the same time, newspaper designers were predicting that by 1985, "the reporter's mind will be processed to the press plate without the handling of the many elements," using the Westchester Rockland newspapers as an

[264]Frank Romano, "Front Page or Front Screen?" American Printer, June, 1982, pp. 41, 42.

[265]Brian J. Dooley, "Pagination Exotica: For Printers, What Next?" Printing Impressions, July 1982, p. 11.

[266]Earl Wilken, "Full-page pagination system onstream at WRN," Editor & Publisher, March 28, 1981, p. 30.

example.[267] While some were being optimistic about pagination's early application, the Institute for Graphic Communication released a study entitled "Future for Electronic Pagination," which indicated that "while newspapers want full-page pagination and direct-to-plate output, they aren't ready to buy it now." However, it appeared that at least 75% of the publishers surveyed in the study felt they would like to implement a pagination system within the "foreseeable future."[268]

Influenced by the developments which were taking place in the computer industry, new technology was beginning to appear by the early 1980s which would greatly aid the newly introduced process of electronic pagination. Raster image processing was perhaps the most significant of these new technologies because it would allow for the generation of accurate images on the computer screen, rather than the earlier more primitive vector representations. A raster image processor creates an image for inspection from the black and white, or colored dots which compose the background

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[267]"Designers' role enhanced by pagination technology," Editor & Publisher, November 14, 1981, p. 56.

[268]Earl Wilken, "IGC releases study on pagination," Editor & Publisher, October 24, 1981, p. 50.

of the computer screen. These picture elements, or
pixels can be varied in intensity, and different
screens can offer extremely high resolution qualities
with higher numbers of pixels per inch.[269] One of the
most significant aspects of raster image processors is
that the images produced on their screens can be
translated to sophisticated color printers, as in the
case of reproducing color illustrations, with a high
degree of accuracy and quality. For newspaper work, it
is possible to generate halftones from pixel imaging.[270]

Although pixel imaging technology was available in
the late 1970s, it wasn't until 1982 that systems
became generally available for the reproduction of
color halftones. In 1983, the Utica (New York)
Observer Dispatch, and Daily Press, implemented a
Hastech PagePro front end system, which an Eocom EPC
raster image processor and Eocom laser plate exposure
unit, making complete computer-to-plate pagination
finally operational in a U.S. newspaper.[271] Utica had

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[269]Ibid., p. 375.

[270]Ibid.

[271]"The Utica Story: Direct-to-Plate Output
Becomes a Reality," The Seybold Report, November 14,
1983, pp. 1, 3.

been working on a pagination system since 1976, but had

not been able to effect complete pagination until 1983.

At the same time as the Utica achievement, other

manufacturers began to announce the introduction of

complete computer to plate pagination. Atex added

several components to its 500 family of remote

terminals, including an Integrated Advertising System

(IAS) which included high resolution graphics and text

processing capabilities.[272] The Pasadena CA Star News

also implemented a complete computer-to-plate

typesetting operation in 1983, using Information

International, Inc.'s Newspaper Pagination System.[273]

In 1984, Harris (once on the verge of leaving the

typesetting market completely) and other manufacturers

had introduced even more sophisticated systems which

were improvements on the introductions of even a year

before. The Harris 8300 was based on the cluster

concept of grouping workstations around a contoller

unit which contained four 25MB drives. It also

featured command templates at the workstations, which

made the processing of information more user friendly

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[272]"Atex to show off new graphic system products,"
Editor & Publisher, September 3, 1983, p. 28.

[273]"Pagination in Pasadena: the waiting period is
over," Editor & Publisher, February 19, 1982, p. 47.

for the operator. Harris Corporation asserted that
competition with other systems such as Hastech, Camex
and Xenotron, made its development of advanced tech-
nology vital.[274] Harris's first 8300 was installed in
the Alexandria LA Daily Town Talk, in April, of 1984 to
service a circulation of about 38,550.[275]

The systems introduced in the early 1980s made use
of the raster imaging process to create entire pages,
not just the graphics sections. Another unique
characteristic of raster-image production is that it
creates images on the screen in the order and sequence
that they are detected with a scanner or other device.
The program which is operating the imaging creates
portions of characters as it recreates an image or
page, but doesn't necessarily know, or have to know the
significance of those characters.[276] In fact, the
raster image processor recreates an image in memory by
analyzing algorithmically, the location and intensity
of each pixel in the image. The complexity of raster
image processors such as the Camex Breeze, introduced

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[274]"The Harris 8300 Page Layout System," The
Seybold Report, December 10, 1984, pp. 3, 4.

[275]"1st Harris page layout system installed at
Louisiana daily," Presstime, April 1984, p. 66.

[276]Seybold, p. 4.

in 1983, enabled these machines to acomplish many functions including: conversion of recorded copy as ASCII codes into pixels; to be able to alter the size and spacing of these converted characters; to convert the converted characters into different fonts if necessary; controlling the type size and font resolution, using true fonts rather than "generic" ones; to be able to reverse black and white areas on the screen for the whole page, or within given areas; to include graphic fill-in along with pixel generated text; to be able to convert vector images and spline curves into rasterized images; to be able to fill in boundaried areas with patterns or solids; to give different overlapping areas different priorities, which would enable tinting; to be able to use the same machine to create the output of several devices not necessarily having similar resolution properties; to be able to enlarge or reduce images with increased or decreased resolution; to be able to use the same raster image processor for both input and output in real time; to be able to manipulate shapes and data as well as their orientation on the screen; to be able to do the same with pixels; to be able to analyze areas of an image for halftone image production, to be able to manipulate tonal values of image areas as well as color values,

and to be able to accomplish air brushing and retouching.[277]

It is true that most newspapers experimenting with, and implementing pagination systems into their operations drove them with main frame power, or mini-computers using a central data bank, and still do. However, the introduction of personal computers or PCs, into the business world, as has been discussed, has had important effects on newspapers and input-output tech-nology. As early as 1974, some papers were sending their reporters out to events with the Teleram Communication Corporation's P-1800, a portable terminal weighing about ten pounds, with a small screen, key-board and an acoustic modem for telephone transmission of stories to the mainframe or minicomputer after they were keyboarded. Later, the high price ($5,000) of these individual units was reduced, as other companies introduced their own portable versions, such as the Tandy Model 100, weighing only four pounds.[278] Even

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[277]Seybold, pp. 383-384. (Real time is "A mode of computer operation where the computer performs calculations at the same time as the information is passing through its processing units". Heath & Faux, p. 201.)

[278]Paul Kruglinski, "The future is now: personal computers, how newspapers are using the versatile devices," Presstime, June 1984, p. 14.

though the sales of portable computers to the business
world in general has not been that heavy, their
popularity in the newspaper industry has been such that
in 1984, "The Wall Street Journal purchased 275 Model
100s for its 400 reporters, even though the newspaper
has yet to install a front-end system for its
newsroom." [279]

The exploding popularity of PCs in the early 1980s
could be seen in the proliferation of software programs
that were written not only for data processing and
computer functions, but also increasingly for graphics
production also. Newspapers who had increasingly begun
to add personal computer workstations to isolated areas
of their newsrooms, basically out of curiosity, began
to find that the potential of these stand-alone
machines to ultimately replace larger more expensive
systems was compelling. Plus, the interactive nature
of the personal computer, and its ability to utilize
many different kinds of software, made it able to
accomplish functions larger dedicated front end systems
could not. For example, Presstime, in 1984 reported
that "The Los Angeles Times"' use of a PC to process

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[279]Ibid.

and file all the recipes its food editor receives is
but one example."[280]

Becoming interactive with main frame systems also
paved the way for the PC to replace the more expensive
dedicated workstations. PC software was also being
developed to mimic the software used by mainframes and
minicomputers, as in the case of XyWrite II, IBM com-
patible software which resembles its Atex counter-
part.[281]

But text entry wasn't the only area that newspaper
industry forecasters were predicting PC expansion for.
The adaptation of PC software for graphics production
had already begun, at papers like the Saginaw News, who
used graphics programs to help design or dummy their
news pages. In 1984 it was predicted that micro-
computers would soon have the capability to store
digitized graphics.[282]

Meanwhile, newspapers continued to make advances
in computer technology using their sophisticated
minicomputer systems. In 1984, pagination techniques
had developed to the point where a display on an Atex

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[280]Ibid., p. 15.

[281]Ibid.

[282]Ibid., p. 16.

pagination terminal could allow the operator to lay out
eight classified pages at a time. These updated
classified pagination systems could not only show the
operator how the ads would appear composed, allow for
manipulation of copy blocks and graphics, as well as
page order, they also automatically sent the composed
pages to the phototypesetter. The cost of these
systems varied from $100,000 to $400,000 per system,
making them rather expensive for smaller newspapers to
utilize.[283] The same held true for complete pagination
systems at this time, whose high prices and short-lived
laser components, made it such that only four news-
papers were implementing complete electronic pagination
in 1984. But interest in this process continued to be
keen throughout the industry as other papers waited to
see what success papers like Utica's Observer-
Dispatch, and Daily Press would have with electronic
pagination.[284] In the meantime, even more advanced
transmission technologies were appearing on the
horizon, including fiber optics which promised to

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[283]Paul Kruglinski, "More newspapers move toward
paginating classified pages," Presstime, April 1984,
p. 64.

[284]Paul Kruglinski, "Pagination, graphics,
progressing, vendors blossoming," Presstime, January
1984, p. 22.

replace old thick cables and "copper-wire connections"
with thin glass fibers along which digitized
information could flow, via lasers.[285] One source
predicted that the development of this technology would
ultimately allow a trans-Atlantic cable to send 280
million bits of data per second, between Europe and
North America.[286] Some newspapers were already using
fiber optics to send data including, graphics and
photographs, to remote printing plants from their
offices. Some experts felt that the development of
fiber optics technology would ultimately make expensive
satellite transmission of data obsolete.[287]

By 1985, most of the technology currently being
used in newspaper production via electronic pagination
had been introduced and widely analyzed in the industry
media. The ANPA show of 1984 had indicated that while
raster-image technology was definitely in demand,
newspapers were still being conservative about
implementing total computer-to-plate operations in

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[285]Paul Kruglinski, "Fiber optics," Presstime,
September 1984, p. 26.

[286]Ibid.

[287]Ibid.

their newsrooms.[288] Part of the reason for this was
that editors and publishers felt they still wanted the
greater control that pagination could give them, but
also wanted the flexibility of converting their
raster-images to film rather than the cost savings of
going directly to plate.[289]

Newspapers were however, increasingly implementing
pagination systems, especially because of the cost
savings that they offered in areas such as manpower and
time. This was indicated by The Seybold Report in
1985:

> ...The most significant benefit each installation
> has achieved (or will achieve) is the fact that is
> has simplified the overall task of composing a
> complete newspaper page. Pagination had reduced
> the number of people, departments and decisions
> used in this process. The systems take care of
> many of the complicated communications which were
> a challenge before. It has centralized the
> control and minmized many of the headaches. These
> benefits are very difficult to quantify, but they
> are very real nonetheless." [290]

Noting these benefits, more and more newspapers, such
as the Arizona Republic and the Phoenix Gazette who had
complete display ad and pagination systems ordered in

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[288]"ANPA '84: Not Much New Technology, Perhaps,
But Lots of New Orders," The Seybold Report, July 9,
1984, p. 3.

[289]Ibid.

[290]"Newspaper Pagination: How Far Have We Come?'
The Seybold Report, January 14, 1985, p. 22.

1985, were moving toward pagination.[291] The number of vendors had also increased significantly, offering pagination in more affordable price ranges for smaller newspapers with circulations of 100,000 or even under 50,000. This represented a major advance for many of these publishers in the area of text processing, but the problem of integrating graphics and photographs still remained unavailable in most systems.[292] Even for dailies who were installing complete computer-to-plate operations, like the Morristown, New Jersey's _Daily Record_, efficient graphics integration was a concern, considering the high cost of these systems (more than $2 million for the Morristown, New Jersey system). Smaller, less advanced systems on the other hand might cost only around $300,000.[293]

Manufacturers continued to work on perfecting their systems, and most, including new arrivals announced in 1985 that they could integrate graphics and text via the raster-image process, and offer

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[291]"Phoenix Newspapers orders III Pagination System," _The Seybold Report_, January 14, 1985, Special Bulletin.

[292]Paul Kruglinski, "Pagination," _Presstime_, March 1985, p. 30.

[293]George Garneau, "A new computer-to-plate test," _Editor & Publisher_, May 18, 1985, p. 24.

newspapers the option of the more traditional

phototypesetting from second and third generation

technologies, or the new laser-imaging techniques.

Some manufacturers offering pagination systems and some

laser technology were: Scitex America Corp., Hell

Graphic Systems Inc., Crosfield Electronics, Teragon

Systems, Inc., Harris Corp., Hastech, Inc., Atex, Inc.,

Information International, Inc., System Integrators,

Inc., Xenotron, Inc. and Monotype International.[294]

One of the biggest problems for newspaper

publishers now, was how to integrate equipment they

already had in operation, with the rapidly emerging

newer technologies. Whereas a decade ago, publishers

were buying the new phototypesetting technologies and

classified and display ad pagination systems eagerly,

these advances now threatened to become obsolete al-

ready in the wake of complete electronic pagination.

Some companies, including Camex who produced display ad

pagination systems were particularly threatened.

Attendance at the 1985 ANPA vendors' show indicated

that while overall interest in the new systems had

dropped off somewhat, more publishers who attended the

show were actually buying systems, indicating their

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[294]George Garneau, "Pagination surges ahead,"
Editor & Publisher, June 22, 1985, p. 24.

acceptance in the industry.[295] As an indication of this, the Wall Street Journal converted to a fully computerized operation in 1985. The Journal's operation which also produced laser-imaged press plates was considered the most advanced pagination system in the world at that time.[296]

In 1986 and 1987, digital pictures and complete integration of graphics and text in pagination systems was still considered a "thing of the future," although "electronic darkrooms," were becoming more and more common at newspapers and magazines. Also, "portable picture transmitters," or facsimile machines were quickly becoming a popular way to send and receive information from wire services.[297]

The rising popularity of PCs as workstations rather than the older system dedicated workstations prompted some manufacturers in 1987, to drastically cut prices on their dedicated workstations, and to offer increased compatibility with PCs such as the IBM and

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[295]"ANPA '85: Display Ads, Pagination & Color," The Seybold Report, June 30, 1985, p. 3.

[296]George Garneau, "Wall Street Journal now fully computerized," Editor & Publisher, August 17, 19085, p. 32.

[297]C. David Rambo, Presstime, June 1986, p. 24.

Apple models.[298] On the input/output end of technology,
companies like Autologic were offering laser-printing
equipment which offered faster operating times, higher
resolution and better reliability.[299] All in all, the
number of options now available to newspaper publishers
was quite amazing, but some forecasters indicated that
the industry was entering a crisis. The high cost of
competing with those who had switched to electronic
pagination, as well as the anxiety of dealing with
fairly unproven systems, left many newspaper publishers
reluctant to abandon their mainframe or minicomputer
operations in favor of installing complete electronic
pagination systems. The solution to this, proposed by
industry experts, was to integrate the newest tech-
nology with systems already in use via the personal
computer.[300]

Conclusion

Thus, by 1988, the direction of electronic
pagination had moved quite a distance from its be-

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[298]ANPA '87 Part I: "Display Ad Systems,
Input/Output, Wire Services," The Seybold Report, June
29, 1987, p. 3.

[299]Ibid., p. 28.

[300]"PCs in Newspapers: Will Anything Stop the
Tide?" The Seybold Report, January 19, 1987, p. 3.

ginnings in the early 1970s. While raster-imaging

technology had been developed to a very advanced state,

allowing those with the proper hardware to completely

integrate text, graphics and photographs on a computer

screen and then transmit them to film, or photographic

paper, complete pagination was still problematic for

many. This was because of the disparity between

systems already in use, and the requirements of the

technology actually required to perform complete

pagination functions. Because of this newspapers were

also somewhat reluctant to adopt complete

computer-to-plate operations, as their existing set-ups

made it more efficient for them to use pagination to

produce photographic film first.

This reluctance however, seemed to be changing in

1988, when The Seybold Report, discussed the advance of

the "Fourth Wave" in publishing. This newest wave of

technology brings the newspaper publisher more directly

into the mainstream of the computer industry, and is

embraced with increasing popularity by the newspaper

industry. Now the concept of "What you see is what you

get" (WYSIWYG) is more actively sought after than ever

before. WYSIWYG basically applies to the idea that

what the computer operator creates on his video

terminal, is exactly what will appear in the finished

product, including type size and design, picture and graphics resolution and color.[301] Much of the credit for this new interest can be credited to the personal computer which has allowed the newspaper industry to make the adjustment between the technologies of the 1970s and the 1980s. In 1988, many manufacturers were beginning to offer their publishing systems in PC-based packages, and the term "desk-top publishing" was becoming increasingly common in other types of business, too.[302]

The next chapter will discuss the direction that the developments of the 1970s and 1980s are taking for the future, through the assessments of newspaper publishers who are actually using pagination now. It will indicate how thoroughly the technology has changed the face of an industry in less than 20 years, which had been using the same techniques for nearly five centuries prior to the advent of phototypesetting.

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[301]"Seybold Seminars '88: Welcome to the Fourth Wave," The Seybold Report, April 11, 1988, p. 3.

[302]Ibid.

CHAPTER V

SURVEY OF EMERGING TRENDS

Perceptions of the Newspaper Industry on the
Current State of Electronic Pagination.

Introduction

In the previous chapter, the development of

electronic pagination systems between 1975 to 1985 was

analyzed. As part of that discussion, developments in

the industry before 1975, i.e., the 1960s and early

1970s, were also included where applicable. This is

natural, since the electronic pagination boom did not

happen in a vacuum. Indeed the events of the 1950s, in

which photocomposition began to take hold of American

newspapers, were truly a revelation for them, perhaps

even surpassing electronic pagination.

As ANPA representative Peter Romano noted during

our telephone survey,

> The front end systems that we introduced
> back in the late sixties, VDTs and OCRs, gave
> us the opportunity of getting into the news-
> room and making that more efficient, and also
> eliminating the redundancy in producing type
> before it actually became hard copy. So the
> big nut, the big savings was, in composi-
> tion, combining the editorial input with the
> cold type, and the VDTs. From here on in, you
> know, the savings becomes....We've taken the

cream off the milk. Any savings that are
accrued are going to be very minimal.[303]

While pagination offered newspapers savings in
time and manhours per page, photo-offset, or in some
cases, cold type had already effected the significant
reduction of composing room staff that allowed tre-
mendous savings to newspapers. As the transcript of
the telephone surveys in Appendix D indicates, most
newspapers using pagination were using offset first.
The effect of this was that while most all the survey
respondants felt that computerized printing was indeed
a good thing, it had not provided the substantial sav-
ings that its progenitors promised in the 1970s.

Method

As indicated in the introduction, this survey was
used to identify current and developing trends in
pagination. To introduce the survey, a letter (see
Appendix B) was sent to twenty managing editors,
production supervisors and similar personnel at
newspapers, who were currently using pagination
systems. Due to their time limitations, a total of
nine representatives were able to respond in depth to
the telephone survey.

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[303]Peter Romano, from the telephone survey
transcript, Appendix D, p. 211.

A list of questions was sent along with the letters, but because the mailing list furnished by the ANPA was not current, many of the persons who were ultimately contacted were different than the ones the original letters were sent to and so, they had not gotten a chance to see the questions in advance.

Eleven questions (Appendix E)) were asked of the nine respondents during the telephone interview. They were asked to give their opinions and perceptions based on their experience with electronic pagination systems. The respondents were also informed that they would receive a summary of the survey results.

Although the survey questioner followed a set list of questions, considerable latitude was allowed for individual respondents and occasionally, extra questions were asked pertaining to the respondent's specific situation. These additional questions and responses are recorded in the transcript in Appendix D. Further, when the researcher noted a trend or a point that hadn't been considered as part of the questionnaire, this was also added to the survey at some point. (An example of this was the discovery that electronic pagination systems were not responsible for significant cost reductions because of the fact that most newspapers had already switched to cold type prior to that. So the questioner asked several respondents if

they had already switched to cold type before adding their electronic pagination system.)

The questionnaire was tested for validity by a panel of experts. These experts were chosen for the depth of their research and knowledge in daily newspaper production technology. The panel was requested to check the instrument for clarity, for proper expression and validity of the items. They were also asked to eliminate those items that they thought were repetitive, or lacked objectivity or validity, and to add any others that they considered valid.

After conducting the telephone surveys, the answers of the respondents were analyzed for similarities and differences and a composite picture of the current state of electronic pagination in U.S. daily newspapers was derived. This is presented in the Discussion section in this chapter.

Subjects

The subjects for the survey were compiled from a mailing that was conducted, using a list provided to the researcher by the ANPA. The list originally contained twenty entries. Of those, nine were able to be contacted for a telephone interview. Appendix C describes the nine subjects who were interviewed according to their organization and address, job title,

circulation size, and pagination system in use. The
respondents represent organizations and newspapers with
a range of circulation sizes from a high of nearly
600,000, to a low of less than 20,000. Because the
respondents were promised confidentiality, the tran-
script of their interviews does not identify them.
However, it is noted that all respondents who agreed to
be interviewed seemed enthusiastic about sharing their
thoughts.

Discussion

It should be noted that the manner assumed by the
researcher during the telephone conversations with the
respondents was fairly casual, and allowed for whatever
type of response the respondent might choose to give.
This was deemed necessary, not only to make the
respondents feel comfortable and more willing to give
up some of their busy time to participate in a tele-
phone interview, but also to allow for latitude in the
various organizations represented. While all the
respondents, except for Mr. Romano, were at operating
daily newspapers, their individual situations had many
unique aspects that could lend valuable insight to a
study such as this. Therefore, if a respondent could
not give the researcher say, a percentage of
productivity increase as a result of implementing

pagination systems, this was accepted, although the respondent was encouraged to elaborate on his/her answers whenever possible. Some of the respondents had much to say about their views on pagination, while others gave largely one word answers, sprinkled with strategic insights here and there. All, though, seemed to hold well-formed opinions about pagination which, while containing several downpoints, were largely positive. In other words, whatever problems they cited, nearly all felt that pagination in theory worked well and that computer-to-plate pagination was the way of the future. Those who disagreed with this were unanimous in feeling that computer-to-paper (photographic paper), would give the production people and editors better control.

All the respondents were unanimous in their opinion that personal computers would play an increasingly important role in the production of a newspaper, though at least half felt that pcs could not be used to run whole pagination systems. In the following section the composite answer of the respondents is discussed for each question. Questions 1, 1a, 2, 3, 5, 7, and 8 are discussed in more detail because of the specific interests of this study, and are presented with a summary of each respondent's answer.

1. To what extent are considerations of economics and/or technology, pushing newspapers into electronic pagination?

Most of the respondents felt that it was largely economics that was the impetus for pushing their newspaper into electronic pagination. Several noted that technology was an important consideration as well. The respondents' answers are summarized as follows:

1. Economic reasons

2. Economy driven by technology

3. Both economy and technology;because the technology is available, it helps save money.

4. It's not economical to go with paginated newspapers, because paste-up people are merely being replaced with editors on Hastech terminals.

5. The newspaper industry has been striving for the technology, but there have been numerous problems. (Peter Romano, ANPA).

6. Pagination gave the newsroom more control of the product, and also added the economic aspect of reducing composing room personnel.

7. Technology was the main reason.

8. Both technology and economics.

9. Mostly economics, but technology played an important part also.

1a. And for which of the following reasons did you install an electronic pagination system:

-economics
-labor
-quality

Labor and economics were by far the most
compelling reasons for a newspaper to install a
pagination system according to the respondents.
Reductions in composing room staff was the number one
reason cited for updating a newspaper's operating
system. One respondent noted a fifty percent savings
(approximately) since getting the system into opera-
tion. Most felt that quality had been increased but
this was not a primary concern, since photo-offset had
already increased quality considerably. One point that
was mentioned frequently though was the fact that
electronic pagination had practically eliminated
crooked type. The respondents' answers are summarized
as follows:

1. Reduction of labor, specifically composing
room staff, and also the reduction of typographical
errors and crooked type. Quality is only better if the
staff is competent.

2. Economics was reason number one. Quality was
the next most important factor, after that were speed
and versatility, respectively. A considerable reduc-
tion in composing room staff was also noted, from 135
compositors ten years ago to two currently. (This was

apparently a comparison to hot type because this re-
spondent had only had pagination for eight years).

3. Respondent was not there when the decision was
made to implement electronic pagination, but notes that
there was a reduction in composing room staff, mostly
through attrition, noting that the paper hasn't hired
any compositors in the last five to ten years.

4. This respondent felt that economics and labor
had not been saved by installing electronic
pagination, because photocomposition and cold type had
already been in gear. He felt that the current system
was actually more expensive in some ways than usng cold
type. However, he did feel that the quality was in-
creased, because of the reduction in paste-up errors.

5. Peter Romano noted that perhaps the industry
and developers started too soon with the drive to put
computer-to-plate pagination in newspapers, because
the technology had not been developed enough. He also
noted, like respondent #4, that cold type had already
effected most of the major cost savings that news-
papers experienced. A major problem that Mr. Romano
noted was that computer systems could not provide
enough memory to adequately handle the manipulation of
pixels, and thus the integration of photography into
text.

6. The new system was economical because it saved labor in the composing room, vastly cut down on page makeup time, and increased overall quality.

7. Quality was the main reason for the installation of a pagination system, also speed. This respondent did not think there was an overall reduction in composing room staff.

8. This respondent noted that installation of a pagination system had saved somewhere in the area of fifty percent in composing room costs. Quality had also been increased, with crooked type becoming a thing of the past. He noted that the paper had installed pagination at the same time as cold type and had experienced a dramatic, almost "overnight", change.

9. Economics, labor, and quality were all reasons for installing the pagination system, but this respondent noted that reduction in composing room staff was the major one.

2. As a result of installing an electronic pagination system, has there been an increase in productivity? How do you measure it?

Surprisingly most of the respondents insisted that there had been only a slight increase in productivity, or none at all. Apparently, the dramatic increases in productivity had occured with the advent of cold type. Some respondents did feel that productivity had been increased but was offset by other factors. Several

respondents noted that productivity could be measured by the amount of time spent producing a page, or as one put it, man-hours-per-page. The respondents' answers are summarized as follows:

1. This respondent asserted that in terms of man hours per page, there had only been a very slight increase in productivity.

2. This respondent affirmed an increase in productivity as measured by pages produced within a given time frame.

3. This respondent said that there was an increase in productivity measured by the decrease in overtime hours during the busy times of the year.

4. This respondent compared the overabundance of compositors used on the old system (they had seventy compositors, but they did not need that many), to an overabundance of Hastech terminal editors currently. He asserted that if you're coming from hot type to pagination, then there is a significant productivity increase, but if the newspaper has already switched to cold type, that's not always the case.

5. Peter Romano of ANPA noted that the biggest cost center was the cost of the paper for newspapers, and since there wasn't very much that could be saved there, the next cost center was composition, especially when hot metal was still the prevailing mode of pro-

duction. So because the cold type systems with VDTs
solved that problem early, later additions to the
pagination process produced only minimal additional
savings in general.

6. This respondent felt there was an increase in
productivity, as measured by more pages produced in a
shorter period of time.

7. This respondent felt that there was an in-
crease in productivity as measured by better quality
and quicker output.

8. The increase in productivity at this newspaper
was measured by a reduction in composing room staff,
and at the same time an increase in page count.

9. No increase in productivity

3. Have there been savings in material costs -- what
is the estimated percentage? Any increase in problems
because of electronic pagination systems?

Again surprisingly, many of the respondents felt
that the material savings had not been that great.
Some noted that the savings in the composing room, had
now been transferred to editorial terminals, and that
in some cases it took even longer to produce a page
than before because of the extra time editors spent
manipulating the pages. Several respondents noted that
electronic pagination systems used extra paper, and if
one mistake was found, the whole page was reproduced
rather than just the one column. None of the respond-

ents felt that there had been any significant increase in problems because of pagination beyond the usual start-up bugs. The respondents' answers are summarized as follows:

1. No savings in material costs. According to this respondent, the system was slightly more expensive than using the conventional method.

2. This respondent noted a material costs savings of about fifty percent, when they first installed their system, but noted that because of software problems they had to discontinue computer-to-plate and return to using a photocomposition machine.

3. No comment on material costs.

4. No. This respondent remarked that if there's an error in one line, now the whole page is reset, rather than just the one line.

5. Mr. Romano did not comment on material cost savings.

6. This respondent noted that there was a savings in RC paper because one could get a more exact fit utilizing a full page rather than a column at a time.

7. This respondent said there was no savings in material costs because they had to use a whole sheet of photographic paper even if they only needed to make a column.

8. This respondent noted that there was a savings

in material costs because they weren't using as much

paper.

9. This respondent indicated that there were no

savings in material costs.

4. Have electronic pagination systems helped editorial
departments in presenting later breaking news? Helped
improve readership? How?

While many said that electronic pagination did indeed

help to present later breaking news (one respondent

noted that they once got a late breaking story

into the paper in seventeen minutes), many said that so

far the benefit was only slight. Those who had the

most success with presenting late-breaking news seemed

to have more advanced systems operating. Almost none

of the respondents felt that pagination helped to

improve readership especially, and those who did just

had a general feeling that this was happening. The

popular opinion was that the readership did not really

know that their papers were being produced in a dif-

ferent way. One of the respondents who felt that

pagination did help improve readership, cited the im-

proved quality of the newspaper.

5. After installation of an electronic pagination
system, has there been any change in your newspaper
toward opening up some pages to advertisers who cannot
afford a full press run? Or to produce tailored
information products?

In general the respondents did not feel that pagination had any effect on this. One respondent said that pagination helped them to produce special sections. Newspapers did not change their attitude towards limited or special press runs because of pagination. The respondents' answers are summarized as follows:

1. No change.

2. No.

3. Doesn't think so.

4. Doesn't think so. This respondent noted that his newspaper had opened up some zone pages, but not because of pagination, because it's the trend.

5. Respondent did not comment on this.

6. No. This respondent noted that they were already doing this before the installation of pagination.

7. Not to his knowledge.

8. Doesn't think pagination has affected that.

9. No, paper is too small for that.

6. Do you have a system with the full capacity for an integrated pagination process for combining news text with ads and graphics. (i.e., line art)?

The respondents answers to this question varied widely. Many asserted that their pagination system was fully integrated (i.e., combining line art and graphics), but none had complete pagination. One re-

spondent said that they had had computer to plate about two years ago, but had discontinued it due to software difficulties. Most were of the opinion that nobody had complete pagination, including Mr. Romano of ANPA. When the researcher asked the respondents how close they were to complete pagination, most noted they were quite a way away (by several years). Some respondents were only using pagination for text composition.

7. Is computer to plate pagination the best, and will it meet the necessary criteria of being both practical and cost-effective?

There was some difference of opinion here also. Although most of the respondents answered that computer-to-plate ideally was the best option, a few felt that computer-to-paper is better because it gives them more control over the production process. Most agreed that the ideal situation is still several years away (ten to fifteen years according to some estimates) Most also felt that it would be practical and cost effective as long as adequate care was taken to provide back up. The respondents' answers are summarized as follows:

1. This respondent felt that computer to negative was a better option, because it gave more control to the production staff, and decreased the possibility of catastrophic accidents (memory loss).

2. This respondent felt that computer to plate

was arguably the better option, and would be very cost effective.

3. This respondent felt that computer to plate would be the best option in the near future, but still had a way to go before being feasible.

4. This respondent felt that computer to plate would be the best option "if they ever got it working," and commented that the industry had been waiting since 1973 for developers to make good on their promises of complete pagination.

5. Peter Romano of ANPA felt that computer-to-plate is definitely the next step, and noted that after that newspapers would be produced computer-to-paper, especially with the advent of the erasable laser disk.

6. This respondent felt that computer to plate would allow for some real cost savings, eventually.

7. This respondent felt that computer to plate was still ten years away, and would be practical and cost effective if storage capacity could be solved (memory).

8. This respondent remarked that computer to plate would definitely be the best way to go.

9. This respondent felt that computer to plate was the best option, and would be cost effective.

8. Have there been further steps in technology recently for the newspaper industry? And to what extent will personal computers (pcs) play a role in producing a newspaper?

Mr. Romano and another respondent commented on the development of the erasable laser disk, which Mr. Romano felt would add unlimited storage capacity to pagination systems. Most respondents, however, were not aware of newer technology. All felt that the personal computer is going to play an increasingly important role at newspapers, although many said that pcs could not be (or should not be) used to run whole pagination systems for many reasons including lack of memory space, inefficient compatibility with existing operating systems, and lack of software. Mr. Romano made a special point of noting though, that increasing standardization in the newspaper and computer industry would bring the personal computer, as well as other technologies (such as satellite transmission of ads) to more and more newspapers. The respondents' answers are summarized as follows:

1. This respondent felt that personal computers were getting close to being an important technological tool for newspapers, but they still had to solve the problem of memory storage. The size of the newspaper was also a factor.

2. This respondent felt that most of the current
advances in technology were being made in the area of
graphics. He felt that there was a big push to get
both screened half tones and line art on the page, but
that efforts were being hampered by the "inadequacies
of the equipment." He felt that personal computers
would be valuable as part of the front end system, but
a newspaper wouldn't want to be totally operated from
pcs, because of storage limitations, security problems
and hardware compatibility.

3. This respondent mentioned the laser setter,
as a new technological development that would help
speed up production at remote sites. She felt that pcs
were more appropriate for smaller newspapers right now.

4. This respondent felt that personal computers
would play a major role for small newspapers, and that
one could already see their influence in areas such as
ad design. He predicted that soon, ad representatives
would set their own copy and ad, using a pc, rather
than submitting material to each paper's composer.

5. Peter Romano of ANPA mentioned several
technological developments including the erasable
laser disk, which he asserted would give newspapers
almost unlimited storage capacity for graphics mani-
pulation. Further he mentioned that after computer to
plate, newspapers would one day be producing their

papers "computer to paper" (as in newsprint).
Electronic cameras are a new development that are
beginning to be seen more frequently now. A reporter
using an electronic camera would be able to transmit
photos over the phone. As for the ANPA, Mr. Romano
commented that they were developing a computer task
force to investigate international standards for
pagination with regards to wire services, photographers
and other related areas. They are also involved in the
development of the ADSAT network, which will facilitate
the satellite transmission of national and regional
advertising to newspapers from transmitting offices.

6. This respondent felt that there would be an
increasingly larger role for the personal computer in
the production of newspapers. He noted that at his
paper, some people were using pcs for isolated tasks.

7. This respondent noted that his newspaper was
investigating pcs for their front end operation, but
felt that they ultimately had their limits. For
example, he noted that there was no comparison between
a pc and an XVC (Xenotron) workstation, in terms of
quality and compatibility. He noted also that personal
computers could not offer the resolution of pixels that
dedicated systems did, and that pcs were limited as to
page size. For editorial text storage though, they
were fine.

8. This respondent noted that he felt the pc
would play a definite role in newspaper production,
because of cost factors and the increasing avail-
ability of off the shelf software.

9. This respondent indicated that pcs would play
an increasing role in newspaper production.

9. Have there been any other developments and research
conducted in readership reaction to the quality of
editorial and production of newspapers? Please
describe.

Most of the respondents knew of no readership
reaction surveys at their newspaper, but some had heard
of similar things. Many said that readers sent letters
to the editor to comment on changes that the papers
made from time to time.

10. Are vendors able to meet or to relate to the
unique way that your newspapers operate?

Most respondents felt that vendors whether they
were the pagination system suppliers or other vendors
selling services to the newspapers, were relating well.
Pagination vendors however, were cited as not being
able to meet the needs of newspapers in several cir-
cumstances. One respondent noted that he thought that
vendors weren't putting enough effort into fully de-
veloping the new technology, that they were too order
driven.

CONCLUSION

When asked if they had any comments to add about

electronic pagination, the overwhelming response of the respondents was that pagination was working as well as they expected or better at their paper. While computer-to-plate pagination was still several years away for most, it was a development they welcomed. No matter what the problems facing the individual newspaper (union conflicts, software problems, technological gaps) all seemed to indicate that computer-to-plate pagination was the "wave" of the future. Some commented that the fervor over pagination in the 1970s had been premature, started before the technology was ready to even remotely support the claims made for it. But none of the respondents expressed regret for having installed whatever system they were using beyond the fact that the technology was not developed far enough. One respondent did note that he felt composing room staff had been replaced with too many Hastech terminal operators, but this was about the most severe complaint that any of the respondents offered as to the value of pagination.

CHAPTER VI

CONCLUSION

Introduction

If there is anything to be said about the ability
of men to communicate and share knowledge during the
last hundred thousand years, it is that this ability
has increased exponentially in shorter and shorter
periods of time. Where human beings once drew pictures
on the walls of caves to describe the world they knew,
today's men generate communication with sophisticated
technologies and artificial intelligence. And the
ability of some nations to share knowledge with others
at remote distances, holds unlimited promise for those
still striving to catch up.

In no small way, the advancement of technology has
been closely interrelated with the advancement of
printing technologies. Just as the medieval world
experienced a revolution in potential with the
appearance of Gutenberg's press, so the modern world
has experienced similar leaps, with the advancement of
computer technology. The difference is that things are
happening at a much faster rate now. Technology has

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changed our world so much in the last quarter century

(in the United States especially) that we scarcely

recognize that it continues to do so daily.

Computer-age printing technologies have advanced human

potential to previously undreamed of heights. Antony

Smith comments on the direction that print media is

taking for the future in the concluding chapter of

Goodbye Gutenberg:

> The newspaper has grown bigger and bigger as a
> response to the increasing variety of tastes and
> interests within its audience. After three and a
> half centuries this process is reaching its culmi-
> nation, and the next technological stages in news-
> paper history and in the history of communication
> devices in general must lead to the stripping away
> of some forms of information from the newspaper
> and to their transmission to readers in other
> ways. One can look at it a different way and
> argue that the dividing lines between different
> print media, ranging from the broadsheet to the
> newspaper, the weekly and monthly magazine, the
> paperback, the pamphlet, and the hardcover book,
> are all shifting as a result of opportunities
> offered by new techniques and changing markets.[304]

This can be readily seen from the information given by

Mr. Romano about the advances that are being made in

production technology for the newspaper industry. With

increased computer storage capacity, refined graphics

abilities and satellite transmission of advertising,

newspapers can offer more and varied types of infor-

mation to their readerships.

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[304]Antony Smith, Goodbye Gutenberg (New York: Oxford University Press, 1980), p. 319.

Discussion

Conversely, just as in Gutenberg's time, the need for more efficient ways to print and present knowledge have encouraged the quick development of these technologies. Because of the speed of technological advancement today, it is easy to look at the current developments in newspaper pagination and say that things are going too slowly. It's been nearly twenty years since industry experts predicted the day when newspapers would be produced completely via computer. Despite all the research and money spent to develop systems to accomplish this, that day has not yet arrived, though it draws steadily closer in the opinion of those in the newspaper industry. Still the amount of change that has taken place during this time, in the way newspapers operate, and the cost savings that have been realized by many daily newspapers in the United States, is truly remarkable. Peter Romano of the ANPA, noted during our telephone interview that if one were to compare the way the cost of computer technology has dropped since the 1970s to the price of a Rolls Royce, one could buy the elegant car for about one dollar.

The changes continue. to take place in the newspaper industry. The next wave, as Mr. Romano predicts,

may be the personal computer and the era of standard-

ized operation. This would certainly be a boon for

newspapers, who have been traditionally plagued by

specialized equipment which becomes obsolete too

quickly to make full usage of emerging technologies.

Peter Romano noted that while the initial wave of

pagination technology originated within the industry,

the results of that revolution are now affecting

newspapers from the outside. He stated:

> ...[T]he latest thing which is now entering
> newspapers...is really coming from [outside the
> business]. Newspapers started, believe it or not,
> the VDT revolution...[W]hen people were talking
> about word processing, in the last five years,
> newspapers were doing this starting in the late
> sixties. That was nothing new for us, and
> newspapers were developing through manufacturers
> proprietory electronic editing systems, in
> essence. for years. And they're commonplace in
> almost every newspaper in the country. Now comes
> the pc revolution. And that's what's hitting
> newspapers now. However, this revolution is
> coming from outside the business, into the
> business.[305]

The advantages of this according to Romano, are that

pcs offer the possibility of intermingling different

types of equipment from different vendors through a

standard operating platform. While the newspaper

representatives who were surveyed in this study in-

dicated doubt about the ultimate ability of personal

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[305]Peter Romano, interview transcript, appendix D
p. 67.

computers to drive complete newspaper production

systems, they all felt that personal computers would

play an increasing role in that production. The rising

tide of the pc in the newspaper industry was commented

on by the Seybold Report, in 1987:

> It appears to us that the newspaper systems
> market in the U.S. is in a crisis. The promises
> of everything-from-one-vendor, of completely
> integrated solutions, for the most part have not
> yet materialized....More and more newspapers are
> getting tired of waiting for the ultimate solution
> and are moving to install components such as new
> display ad systems and new output typesetters.
> The result is that the potential market remaining
> for completely integrated solutions is shrinking,
> and the difficulty of implementing them is
> increasing....The situation is compounded by the
> rising tide of PC's and PC systems. One of the
> traditional systems vendors said to us recently,
> 'If you write anything more about PC's, we will
> throttle you'. Our response was that we have no
> choice. Surely everyone must realize by now that
> PC's are the central fact of life for everyone
> involved in newspaper systems. You cannot ignore
> them. They are not going to go away.[306]

Indeed the problem of trying to get complete pagination

from an integrated system, was commented on by nearly

every respondent in the survey. Perhaps the personal

computer will provide the link which will allow the

final steps in pagination to be realized.

Although it was not the purpose of this study to

come to any conclusions about this still changing

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[306]"PCs in Newspapers: Will Anything Stop the
Tide?," The Seybold Report, January 19, 1987, p. 3.

industry, there are yet a number of general
observations that can be made based on history and the
opinions of the newspaper production personel who were
interviewed. The first observation is that the
newspaper industry seems to feel that computer to plate
technology is developing too slowly. Most of the
people who were interviewed noted that the technology
that would bring their newspaper complete pagination
was still a number of years away in their opinion (ten
or fifteen by some estimates). This indicates how
vastly different their operating environment is from
printers who carved each letter of wooden blocks and
then embraced the same new printing technology for
three hundred years before the appearance of
typecasting machines. Today's newspaper publishers and
production staff take for granted that plateless
printing is just around the corner.

However, it is possible that their expectations
are not totally unfounded, history notwithstanding.
Several of the survey respondents had complained that
the promises of pagination vendors and developers, that
were made in the early 1970s were never fully realized.
Peter Romano noted:

> Pagination is...a goal that they're all
> striving for, and they have for years and
> years..., going back to...the Newspaper
> Systems Development Group. Ah, that was

maybe premature, ahead of it's time, ahead of
technology I think....[Q: Do you think that's
because they started too soon?] Yeah, they
started too soon." [307]

A possible result of this premature drive to install
the new technology was that newspapers bought systems
they could not fully implement. This was evident in
the survey responses. One respondent discussed how his
newspapers had full pagination but then had to
discontinue it because of software shortcomings.
Another problem was that since graphics integration was
not fully developed, newspapers were forced to marry
pagination systems which were designed towards complete
integration of text and graphics, with older tech-
nologies. This has brought about the assumption on the
part of at least some of the survey respondents that
computer to negative is actually a better process than
computer to plate.

Another interesting observation about the
development of pagination since the early seventies is
that perhaps its benefits have been somewhat
overshadowed by remarkable technologies that appeared
in the 1950s and 1960s, with offset or cold type
printing. By and large, the largest savings that

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[307]Peter Romano, interview transcript, Appendix D,
p. 208.

newspapers experienced according to the interviews were in the reduction of man hours per page that occured when newspapers switched from hot type to cold type. For many, that came after the appearance of OCR, and CRT terminals in the early seventies. One production manager noted that switching to newer technologies at one point had saved his paper the labor of 135 composing room staff people. However, that reduction did not come directly as a result of pagination, but arrived in concert with cold type and computer text input. Even Peter Romano, as noted earlier, asserts that earlier technologies took the "cream off the milk" for pagination, in terms of eventual overall savings for newspapers. Indeed, one survey respondent asserted that:

> ...[O]n the economics side, it's not eco-
> nomical to go with paginated newspapers.
> You just replace one with the other. You
> remove paste up people and you replace them
> as editors on Hastech terminals....You're
> talking just general photocomposition, in
> other words offset has already been in
> gear.[308]

But this is not the prevailing opinion, although the respondents' attitudes about the ultimate effectiveness of pagination did appear to be colored by the time

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[308]Mike Shibuick, interview transcript, Appendix D, p. 53.

frame in which pagination systems were installed relative to other advancements, especially cold type and VDT editing.

A third observation about the development of pagination in newspapers is that it did not happen all at once. Some aspects of newspaper pagination, such as text input and classified pagination, which could be handled on front end systems were developed very quickly, and were in wide use by the mid to late seventies. Other more problematic aspects such as graphic reproduction and the integration of half tones and text lagged behind and for most newspapers still are not used. Most newspapers, if the survey is any indication are still paginating text with only limited integration capabilities.

But according to ANPA's Romano, that may change rapidly with the development of the laser disk which will make unlimited quantities of memory (needed in the production of graphics and pixel digitizing) available. Memory though, may not be the most important problem currently plaguing industry attempts at complete pagination. Several of the survey respondents cited software problems and vendor response as areas which need improvement. One newspaper asserted that they had had complete computer-to-plate pagination about two

years ago, but had discontinued it because of inade-
quate software and an incompatible vendor relationship.
Another newspaper representative complained that his
paper's vendor was "slower than a seven-year itch," and
that vendors tended to be "order- driven" rather than
research-oriented.

Part of the problem too, may come from the
willingness of the newspaper industry to "go" with the
new and as yet untried technologies before they were
really ready. Peter Romano commented during the survey
that the efforts of the Newspaper Systems Development
Group (NSDG) in the early seventies may have been
"premature", based on the amount of existing technology
at the time. The result of the newspaper industry
charging at full speed into the computer age has been
that they are frequently caught between the obsoles-
cence of old machinery and undelivered promise of new
technology. Newspapers have adapted well to swift
change though, integrating the newest front end systems
with more established cold type printers.

Perhaps because of the uneven development of
pagination technologies in the newspaper industry,
production supervisors remain somewhat skeptical of the
newest computers, the personal computer, and their
ability to ultimately handle the entire pagination

process. Most of the survey respondents felt that
indeed personal computers would play a more and more
important function in the production of a newspaper,
but probably would not be used in place of the larger
systems that were currently in operation. Many noted
that they thought pcs did not have the storage capacity
needed, or the ability to be networked to a common
database large enough to accomodate the production
needs of a daily newspaper. Still another asserted
that the graphics capabilities of pcs could not measure
up to the larger systems in terms of pixel resolution.
Perhaps the most significant observation in terms of
eventual reality, was that the newspaper market was too
small to attract significant interest from software
developers who could design adequate production
programs for personal computers. Still, most of the
survey respondents noted that personal computers had
already appeared at their newspaper, here and there.

Despite all the complaints, and the somewhat
surprising discovery that pagination had not saved
newspapers as much money as cold type had, all the
survey respondents felt that their systems ran well in
whatever incarnation they were currently operating, and
had few or no complaints about their perceived effi-
ciency. One respondent noted that at his unionized

paper, there was a relative lack of quality because the personel were resistant to using the new technologies. Another said, that he felt that the savings in composing room staff was being offset by additional text inputters. Yet for everyone, pagination as they knew it got high marks.

Most of the survey respondents seemed unaware of developing trends besides the advent of the personal computer. One respondent mentioned the newer laser technology, and Mr. Romano of ANPA commented on ADSAT, an international satellite to computer transmission of advertising that was being developed. For most of the respondents, the realization of computer-to-plate printing was still the most current technological advance yet to be achieved. Finally, it is observed that whatever the shortcomings of the development of pagination since the early 1970s, nearly all the survey respondents believe that it is only a matter of time before complete pagination becomes a reality and that completely developed pagination is indeed, the best option for the newspapers of the 1990s.

Conclusion

It has been the purpose of this research to investigate the development of pagination systems in

daily newspapers in the United States, since the mid-1970s and to analyze emerging trends based on the opinions of survey respondents in the newspaper industry. From these activities it has been concluded that the newspaper industry is still developing technology with regard to pagination and the goal of complete computerized pagination has not yet been reached at this time.

Another important finding indicated by the research, is that the technology which was started in the early 1970s is expanding already beyond the concept of computer-to-plate production, to computer-to-paper as Mr. Romano indicated. The increasing influence of the personal computer might be the key to the realization of integrated pagination systems, especially if, as Mr. Romano noted, they bring standardized software that can link presently incompatible components. In sum, while there seems to be no end in sight to the development of promising technologies which the latter half of the twentieth century has brought to the newspaper industry; and while the promises of complete computerized pagination are still not fully realized, there is ample evidence that this will soon happen. Perhaps, in the eyes of the current newspaper industry, the fruition of integrated

pagination systems has taken an over-long time. However, viewed from a historical standpoint, in comparison with the advancement of communications technologies since Gutenberg and before, it has been a remarkable and dramatic achievement.

Implications

Historians, printers, publishers, newspaper executives, journalism students and educators, graphic arts students and educators, interested in the development of Newspaper Electronic Pagination Systems in the United States, should find this research useful and a valuable guide.

In addition, the research will be of great value in providing guidance in strategic planning for future use in Lebanon and other Middle Eastern countries (Pan Arab), and under-developed countries, i.e., Latin America and Southeast Asia. It will afford decision-makers more extensive information on trends in American newspaper pre-press production.

For Lebanon and the Pan Arab countries, pagination systems represent one timely investment in new technology to help maintain industry news and information, and communication leadership, into the next century.

The next wave of technology, as everybody in the industry predicts, may be personal computers (PCs) which allow the final steps in electronic pagination to be realized. As for Lebanese and Pan Arab newspapers, with their small circulation (50,000 to 100,000), I believe they should take PCs into consideration, since they will play a more important function in the production of newspapers.

Recommendations for Future Research

Because electronic pagination technology is still young and evolving, this research indicates the need for further and more in-depth research to answer the following questions, among others:

1. Some day, the Advanced Imaging Devices technology will permit photographers to transmit pictures directly to editors, who will then work with them electronically on screen. How can electronic photography be coordinated with newspaper electronic pagination systems?

2. What will be the next wave in data storage, document storage, imaging and graphics, data collection and distribution? Will the optical erasable disc and CD-ROM prove to be the perfect solution for the tremendous number of bits of information associated

with full page electronic pagination and digitized photographs?

3. How will personal computers and telecommunications (fiber optics) for news delivery affect the present character of newspapers and the newspaper business itself?

4. What will be the techniques necessary to transmit information to other cultures around the globe, and what will be the problems, with respect to full-page digital pagination systems?

5. What will be the training programs necessary for journalism and graphic arts schools, to keep up with newspaper electronic pagination technology?

6. How will computer-to-paper (plateless printing) technology shape newspaper format by introducing tailored information products demanded by advertisers and readers?

7. How will newspaper electronic pagination accelerate developments in the computer industry to perfect its chip technology, to provide more computing capability and power to handle color for magazines and catalogues?

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APPENDIX A

PAGINATION INSTALLATIONS[*]

August 22,1986

Phoenix Newspaper, Inc.
120 E. Van Buren Street
Phoenix AX 85004

John Phillips
Production Director
TEL: (602) 271-8000

Information International, Inc. (III)
Circulation:273,000 (m), 105,630 (e),
         409,939 (Sun.)

Long Beach Press Telegram
604 Pine Avenue
Long Beach CA 90844

Gerald Polk
Production Director
TEL: (213) 435-1161

III
Circulation:127,863 (d), 118,678 (Sat.)
         138,588 (Sun.)

Pasadena Star News
Twin Coast Newspapers
525 E. Colorado Blvd.
Pasadena CA 91109

Lester Wiltse
Production Director

III
Circulation:45,373 (m), 49,547 (Sat.)

Rocky Mountain News
400 W. Colfax Avenue
Denver   CO 80204
Pete Walker
Production Director
TEL: (303) 892-5000

Atex
Circulation:317,638 (m), 366,003 (Sun.)

Cocoa Today
PO Box 1130
Cocoa   FL 32923

Vern Bean
Production Manager
TEL: (305) 632-8700

Hastech
Circulation:71,114 (m), 84,562 (Sun.)

News Journal Corporation
901 Sixth Street
Daytona   FL 32015

John Gallant
Systems Department
TEL: (904) 252-1511

Hastech
Circulation:60,914 (m), 29,679 (e)
          82,226 (Sun.)

News & Sun Sentinel Co.
1001 N. New River Dr   Box 14430
Ft. Lauderdale   FL 33302

Thomas E. Rice
Production Director
TEL: (305) 761-4000

Atex
Circulation:95,967 (m), 86,888 (e)
189,178 (Sat.), 233,172 (Sun.)

Alexandria Daily Town Talk
1201 Third Street   POB 7558
Alexandria   LA 71306

Joe Blackwell
Production Director
TEL: (318) 487-6397

Harris
Circulation:39,875 (m), 40,856 (Sun.)

Minneapolis Star & Tribune Co.
425 Portland Ave
Minneapolis MN 55488

John Hovde
Production Director
TEL: (612) 372-4141

Atex
Circulation:373,145 (m), 590,985 (Sun.)

Morristown Daily Record
55 Park Place
Morristown NJ 07960

Howard Eichler
Production Director
TEL: (201) 538-2000

Autologics
Circulation:59,037 (m), 55,689 (Sat.)

Hudson Register Star
364 Warren Street
Hudson NY 12534

Paul Zindell
General Manager
TEL: (518) 828-4355

Harris
Circulation:15,308 (e)Observer Dispatch
221 Oriskany Plaza
Utica NY 13503

Charles Gallagher
Production Director
TEL: (315) 792-5000

Hastech
Circulation:29,704 (m), 34,627 (e)
          58,938 (Sun.)

Westchester-Rockland Newspapers
1 Gannett Drive
White Plains NY 10604

Joseph Ungaro
VP & Executive Editor
TEL: (914) 694-9300

Hastech
Produces 10 newspapers
Combined circulation: 225,000 (d)

Lawton Publishing Co.
PO Box 648
Lawton OK 73502

Glenn Dunn
Production Superintendent
TEL: (405) 353-0620

Xenotron
Circulation:16,150 (m), 17,501 (e)
          31,179 (Sun.)

Oklahoma Publishing co.
500 N. Broadway POB 25125
Oklahoma City OK 73125

Bill Davis
Production Manager
TEL: (405) 232-3311

Hastech
Circulation:236,470 (m), 224,157 (Sat.)
313,508 (Sun.)
Beaumont Enterprise
380 Walnut Street POB 3071
Beaumont TX 77704

Jim Tremont
Production Director
TEL: (409) 833-3311

Hastech
Circulation:71,412 (m), 79,809 (4)

Dominion Post
Greer Building
Morgantown WV 26505

D. Hoffman
Publisher & Gen. Manager
TEL: (304) 292-6301
Hastech
Circulation:19,446 (m), 25,087 (Sun.)

The Reporter (Gannett)
307 Derstine Avenue
Lansdale   PA 19449

Eric Wolferman
Executive Editor
Larry Stasulis
Productin Manager
TEL: (215) 855-8440

Hastech
Circulation:19,500 (e)

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*List provided by ANPA

APPENDIX B

SAMPLE OF LETTER TO PROSPECTIVE SURVEY
PARTICIPANTS

December 28, 1988

Lester Wiltse
Production Director
Pasadena Star News
525 E. Colorado Blvd.
Pasadena, CA 91109

Dear Mr. Wiltse:

I am writing to request your assistance in a
research study being conducted by New York University's
Center for Graphic Communications Management and
Technology. Your name was selected from a list provided
by the American Newspaper Publishers Association
(ANPA).

We are seeking to determine and analyze the impact
of electronic pagination upon the daily newspaper
industry in the United States, and we will be calling
you to obtain information regarding newspaper
electronic pagination systems.

Your responses to the survey will make a valued
contribution to this attempt and your considered
thoughts will have an important bearing on the success
of further development in production technology.

We are writing in advance of our telephone call
because we know that people like you appreciate being
advised before any approach is made. The telephone
interview will take about fifteen minutes of your time.

Neither you nor your newspaper will be identified;
complete confidentiality and anonymity of your
newspaper is assured. I'll be calling you within the
next two weeks.

Thank you very much for your anticipated
cooperation.

Sincerely,

Nouri Beyrouti
Study Director

APPENDIX C

<u>**LIST OF ACTUAL RESPONDENTS TO TELEPHONE SURVEY***</u>

Deena Greenawald
Composing System Operations Foreman
Phoenix Newspapers, Inc.
System: Information International III
Circulation: 273,000(m), 105,630(e), 409,939(Sun)

Mike Shibuick
Operations Foreman
Florida Today
System: Hastech
Circulation: 71,114(m) 84,562(Sun)

John Hovde
Production Director
Minneapolis Star & Tribune Co.
System: ATEX
Circulation: 373,145(m), 590,985(Sun)

Tom Norton
Production Director
Morristown Daily Record
System:Autologics
Circulation: 59,037(m) 55,689(Sat)

Bob Mundrick
Production Director
Observer Dispatch
System: Hastech
Circulation: 29,704(m), 34,627(e) 58,938(Sun)

Glenn Dunn
Production Superintendent
Lawton Publishing Co. (Lawton Constitution)
System: Xenotron
Circulation:16,150(m), 17,501(e), 31,179(Sun)

Robert Eringdon
Director of Technical Services
Oklahoma Publishing Co.
Oklahoma City, Oklahoma 73125

D. Racey
Publisher and General Manager
Dominion Post
System: Hastech
Circulation: 19,446(m), 25,087(Sun)

Peter Romano
Director of Production Department
American Newspapers Publishers Association (ANPA)

* From a list furnished to this study by the American
Newspapers Publishers Association (ANPA).

APPENDIX D

SAMPLE LETTER REQUESTING PERMISSION TO PUBLISH TRANSCRIPTS

Dear Sir:

Recently you participated in a telephone survey on the use of pagination systems at your newspaper, as part of a study on electronic pagination being carried out at New York University. Your responses, which were recorded, were very helpful to the study. As part of the body of data of the study, we would like to print an appendix containing a transcript of the conversations which we held with representatives from various newspapers.

For this purpose, I am asking you to give your permission for us to publish the transcript of your conversation with us, in order to add a further dimension to the study. You would be identified along with your publication, in the transcript and a copy of the whole transcript would be sent to you. In order to give your permission, merely sign the line at the bottom of this letter and return it to us in the enclosed envelope provided for this purpose. A transcript of all the conversations will be sent to you shortly. If you have any questions, please call me at (   ).

Again, I would like to thank you for the invaluable contribution which your responses have made to this study.

Sincerely,

Permission given to reproduce transcript of conversation as part of study, and identify speaker and publication as part of transcript.

Signed:_____ Date:_____

APPENDIX E

<u>NEWSPAPER ELECTRONIC PAGINATION SYSTEMS IMPACT
AND UTILIZATION QUESTIONNAIRE</u>

Your Name _____

Title   _____

Company   _____

Address   _____

           _____

Telephone (_____) _____

System   _____

1.   To what extent are economics considerations, and/or
technology, pushing newspapers into electronic
pagination?

And for which of the following reasons did you install
an electronic pagination system:

    - economics
    - labor
    - quality

2.   As a result of installing an electronic pagination
system, has there been an increase in productivity? How
do you measure it?

3.   Have there been savings in material costs -- what
is the estimated percentage? Any increase in problems
because of electronic pagination systems?

4.   Have electronic pagination systems helped editorial
departments in presenting later-breaking news? Helped
improve readership? How?

5.   After installation of an electronic pagination
system, has there been any change in your newspaper
toward opening up some pages to advertisers who cannot
afford a full press run? Or to produce tailored
information products?

6. Do you have a system with the full capacity for an integrated pagination process for combining news text with ads and graphics (i.e. line art and half tones)?

7. Is computer to plate pagination the best, and will it meet the necessary criteria of being both practical and cost-effective?

8. Have there been further steps in technology recently for the newspaper industry? And to what extent will personal computers (pcs) play a role in producing a newspaper?

9. Have there been any other developments and research conducted in readership reaction to the quality of editorial and production of newspapers? Please describe.

10. Are vendors able to meet or to relate to the unique way that your newspapers operate?

11. Do you have anything to add, any further comments you would like to make?

    Thank you very much - I will send you a summary of the survey results.

APPENDIX F

TELEPHONE SURVEY INTRODUCTION[309]

"Hello, may I speak with M _____?"

"M _____, my name is Nouri Beyrouti. I am a
doctoral candidate at New York University. I am
conducting a telephone survey for my doctoral
dissertation research study, from New York regarding
the impact of electronic pagination technology and
emerging trends in the daily newspaper industry in the
United States.

A few weeks ago, I sent a letter requesting your
invaluable opinion, since the intent of this study is
to provide an up-to-date look at what is currently a
dynamic technology.

Your help and that of others being asked to
participate in this survey, is essential to the study's
success.

I greatly appreciate it."

_____

[309]Don A. Dillman, Mail and Telephone Surveys (New
York: John Wiley & Sons, 1978), p. 242. The intro-
duction provides an important opportunity to persuade
the person on the other end of the line that the survey
is worth his/her time.

APPENDIX G

Transcripts of Telephone Interviews

1:    Tom Norton, Production Director, Morristown Daily Record

Q: What was your main consideration in installing the pagination system? Was it economic, technological?

A: Economic.

Q: And why was that?

A: Reducing of Labor.

Q: You mean mostly composing room staff?

A: That's right.

Q: Do you find that the quality is better in the system than it was with the manual help?

A: That's an argument of question, depending if you did it by hand, you could have good people or bad people, or depending how they did it on the terminal; it could be done right or wrong also. In theory, yes, the quality should be better.

Q: Have you found in general that the quality was better?

A: No.

Q: So, is it basically the same or worse?

A: I would say the same.

Q: Okay. As a result of installing an electronic pagination system, has there been an increase in productivity?

A: Um, boy! I'd say very slightly.

Q: And how would you measure that, in general terms?

A: Man hours per page.

Q: Do you think there's been a savings in material costs?

A: Uh, I'm going to say no. The system we had seemed to be a little more expensive than going the conventional method.

Q: That was the Autologics?

A: That's correct.

Q: Have you had any increase in problems because of electronic pagination?

A: Well, in the beginning, just the setup, there was always the "bugs" that you have to work out. But otherwise, when it worked, it worked, and it worked well.

Q: One person that I talked with mentioned that _there was more stress on the editorial staff, because they had picked up the work that the composing room was doing.

A: Well, now they have to work. More work? It's something that in all reality, yeah, it is more work, it's something that they should want, because what it does, is gives them more complete control over their page. More stress, no, there'she 1950s, it wasn't until the 1960s that the cold type processes really began to take hold. While less than 200 newspapers in the 1950s were utilizing offset techniques, by 1968, over 5,000 papers were, and, by 1978, probably 94% of the nation's weekly papers, and 72% of it's daily papers were printed using offset techniques.[310] While originally, offset was a separate process from letterpress, with the development of cold type, the two ultimately became interrelated. The offset process combined several functions.[311] The efficiency

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[310]Hynds, p. 266.

[311]Hynds, p. 267. Hynds describes a typical offset process, which often used second-generation photo-typesetting methods: "The offset printing process normally begins with the production of cold type by

of such processes had increased to such an
extent by the mid-1970s, that offset presses
could reach speeds of more than 60,000 copies
per hour, wption?

A: No.

Q: Can you tell me why briefly?
A: I prefer computer-to-negative, for the reason
that if you get into a multipress
operation...for backup reasons, for
catastrophic backup measures...for production
problems on the press. If you've got
problems with the plate, you've got to
generate the plate. If you've got a
negative, you can very quickly generate a new
plate from the negative, instead of going
back and repeating the process of generating
the plate.

Q: So you think that gets you more control.

A: Yes. It also gives you more control as far
as being able to go back in the past and pick
up an ad if you can't find the mechanical.
And you actually won't find the mechanical if
it's done on the screen, so the only way you
can make a hard copy is by making a print of
the field of the negative.

Q: Ah, do you think that that's more cost

---

photocomposition or some other process. The paper type
is placed on a pasteup page the size of a newspaper
page according to instructions from news and
advertising de-partments. Space is blocked out for
negatives of any pictures scheduled for the page, and a
negative of the entire page is made. Picture negatives
are stripped into the page negative and the completed
page is placed on a highly sensitive metal plate. A
powerful arc light is then shined through the openings
in the negatives to burn the images onto the metal.
The plate, which is flexible and can be bent to fit the
curvature of a rotary press, is chemically treated so
that ink will adhere only to the proper places. When
the press is activated the plates pass first by
moistening rollers and then by ink rollers. The ink is
rejected by the water-covered areas but ac-cepted by
the treated image areas. The image is trans-ferred
from the plate to a blanket roller and then to the web
of paper as it passes by the cylinder".

effective in the long run?

A: Yes.

Q: Have there been any further steps in
technology recently for the newspaper
industry? And to what extent will the
personal computer play a role in producing a
newspaper?

A: Well there's always advancements. I think as
far as the pcs are concerned, they're getting
close, but they haven't broken through yet.
One of the main problems used to be storage.
If they can resolve that, then it depends on
what size newspaper you are, to see if a pc
is applicable to your system.

Q: Do you conduct any research into readership
reaction to pagination in your particular
newspaper?

A: No.

Q: Do you get any reaction at all?

A: Not from pagination, people don't know on the
street, how we do our newspaper. They don't
know if its conventional or pagination.

Q: Okay. Are vendors able to meet or to relate
to the unique way that your newspapers
operate?

A: I can't say. There was really no change. The
only time they reacted is if their ad did not
reproduce well and it was caused because of
pagination. (Confused client with vendor)

Q: Do you have anything you'd like to add or any
further comments you'd like to make about
pagination.

A: Well, I think it's there, and I think it's a
force to be reckoned with. The system we
had, combined with the people that we had
working here in this environment, they did
not mix.

Q: You think the union influenced this?

A: The union here hindered the process somewhat,
because of jurisdiction. You know, if

there's a loss of jobs, they're going to
fight that to the hilt.

Q: Do you think that's still a factor, the
union? What I mean is, wasn't there a point
when the unions were more involved in this.
What I'm wondering is now, is it still a
factor in people's attitudes toward
pagination?

A: Well they know it's coming. Everybody knows
it's coming. It's just a matter of when, in
what paper it comes first, and how it comes
about. It can be handled in different ways
depending on how your union structures are.
Some are broken down into different factions
where it doesn't affect one department, and
it affects another department tremendously.
It also depends on the company's attitude,
whether they bring in pagination and want to
wipe out a complete department. Or whether
they want to be nice people, and take
reductions through attrition. They're all
different ways, and it depends on the
communication between management and the
unions.

Q: Thank you very much.

2: Bob Mundrick, Production Director, The
Observer Dispatch

Q: To what extent do you believe economics and
or technology has been pushing newspapers
into electronic pagination?

A: Do you want a percentage?

Q: If you want, or a subjective answer is fine
also.

A: The economy did you say?

Q: Do you think it's economics or technology...

A: Technology is driven by technology, so ah, I
mean, technology is driven by economy, and
consequently, a hundred percent, I don't
think there's any question to that.

Q: In the case of your own newspaper, the
Observer Dispatch, what were the reasons you
installed the electronic pagination system?
Was it economics?

A: Economics was item number one.
Q: Any other reasons? Quality, or labor.

A: Yeah. Quality is number two. Number three,
      speed. And number four, it really allows the
      versatility for an editor to get what he
      wants. So I guess maybe you can say ah, we
      got style.

Q: Okay. Have you noticed anything specific in
      relation to setting up your pagination
      system? Some people said they had a
      reduction in composing room staff, anything
      specific?

A: Well we've had a considerable reduction in
      our composing room staff. At one time, we
      had 135 compositors in this plant. That was
      about ten years ago. And today, we have two.

Q: That is quite a reduction. And how long have
      you had your pagination system?

A: Ah, we've had our pagination system since
      1980. We're one hundred percent pagination,
      we don't send any galley type at all.

Q   As a result of installing your system has
      there been an increase in productivity?
A: Yes.

Q: How do you measure it?

A: Ah, we measure it by pages produced, within a
      given time-frame.

Q: Great. Have there been savings in material
      costs?

A: Ah, definitely.

Q: Could you give me an estimate?

A: Ah, in material costs I would say somewhere
      in the neighborhood of fifty percent. Now,
      we had the only one in the world, in this
      property, to from computer-to-plate. We were
      doing that for approximately two years. So
      consequently, we took one step more or less
      backwards, when we had to go to a
      photocomposition device. And, we did not use
      the film and the RC papers that we presently

use today, when we went directly to the plate. So consequently they were quite shocked when we went back to producing a paper using negatives.

Q: Why did you do that?

A: Ah, the company that we bought the equipment from had specific standards to meet, and they had a given time-frame to meet them in. That company sold to a company called Gerber Scientific. And they had to do some more software work dealing with graphics. And Gerber Scientific would not do any more R&D, I guess you would call it. And so we had the hook in the contract to say, "well okay guys, sorry, but you own it lock, stock and barrel. Now Gerber Scientific did not want any part of it, so we sold it back to the other company, which the division we were working with was EOCOM, in California. And EOCOM sold that to Gerber Scientific, and I don't know whether Gerber Scientific kept that division going or not, but certainly not with our participation, so they still have that piece of equipment, they're trying to get it down to the Smithsonian, except that we did not get there.

Q: So basically, they could not deliver what you needed?

A: That's correct. And that was about three years ago.

Q: So have you found any increase in any other types of problem because of electronic pagination?

A: The only increase, with electronic pagination, and this holds true, with even a front end system, are the typos. They get into the paper because there is not a printer. He's probably a high school educated person, but having been dealing with words for a number of years, they were a whiz at spotting misspellings. And consequently, you lost that segment of the production mind, when they left. And so what you put into it, is what you get.

Q: Do the systems have a spell-checker?

A: Yeah, the systems have a spell-checker, some
     of them use it, some don't. It all depends
     on how rushed for time they are.

Q: Have electronic pagination systems helped
     editorial departments in presenting later-
     breaking news?

A: Oh, most definitely. And I don't even have
     to discuss that with the executive editor
     here, we've already discussed it ourselves.
     Ah, we have had a fire in the city break, the
     person on site had a personal computer, a
     laptop. He got to a phone, phoned it in, got
     it in the system, and we had it on the press
     within seventeen minutes.

Q: That is fast. Has pagination helped improve
     readership?

A: Oh, I don't know that it has. I don't think
     that that's a result of pagination. I
     believe it's more a result of style of your
     newspaper and what type size you use, the
     fonts you use, that the readership gets used
     to in a particular area. So I don't believe
     that that's increased readership, no.

Q: After installation of an electronic
     pagination system, has there been any change
     in your newspaper toward opening up some
     pages to advertisers who cannot afford a
     full press run? Or to produce any other
     kinds of tailored information products?

A: No, not really.

Q: Okay. Do you have a system with...you said
     before that you had full capacity for
     computer-to-plate.

A: We did, yeah, we don't now.

Q: Is computer-to-plate pagination the best, do
     you believe?

A: Is it the best? Well, that's kind of
     difficult. Yeah, I would say it was, sure.
     You're not dealing with that intermediate

step of shooting a mechanical or page on a
camera, so quality-wise, yes, it is better.

Q: How about in terms of being practical and
      cost-effective?

A: It's very cost effective.

Q: Have there been further steps in technology
      recently for the newspaper industry, and to
      what extent will personal computers (pcs)
      play a role in producing a newspaper?

A: Yes, I think most of the efforts today are
      toward graphics. Now graphics has an A and
      a B. And that's both screened halftones and
      line-art. And I think there's a big push on
      that, to be able to put that on our page. I
      mean we're doing it, but not to the extent
      that we'd like to. That's because of the
      inadequacies of the equipment.

Q: Okay, and how about personal computers?

A: Personal computers have a place in the scheme
      of front ending a pagination system. But I
      don't believe that you would want to have,
      typically what's a front end system in a
      newspaper built out of one hundred percent
      pcs. And that's a pet peeve of mine. We
      have a lot of pros and cons on that in the
      industry.

Q: So why don't you think you'd want to have...

A: All pcs? Well because with a constantly
      changing data base, and a constantly changing
      software enhancements program, fonts,
      whatever you want to call it, it's most
      difficult to keep all of the individual pcs
      up to, we'll call it "revved level," of your
      software. And file-sharing, you want to have
      one central area for wire service, ah,
      library work, and I'm talking about internal
      library, and passing files from let's say,
      person to person, you'd have to know where
      that person is sitting. So, it's geography.
      Outside of that, I think a pc makes a
      wonderful terminal, and it kind of allows an
      open window if you will, to the outside
      world. On our system, we do not allow anyone
      from outside to gain access to our data

base, and consequently if we wanted to
utilize someone else's library, we can go
poking around in their library, retrieve the
files necessary from the pc system, whether
its a hard disk or floppy, or whatever, and
then edit it, do whatever we want to it and
then enter it into our data base. Of course
there's a lot of noise about viruses and
stuff, we really don't want to encounter
that. That eliminates it for us.

Q: What is the typical storage capacity of a
      Hastech or an Atex system, as compared to
      a...I know they're coming out with pcs now,
      with storage bases of 100 megabytes or 150
      megabytes.

A: That would be great, but as an individual
      user, you don't want that, you could not keep
      track of all the files on an individual
      basis, to logically operate efficiently in
      your job, if you were an editor. There are
      only so many stories, and I'm talking about
      Features now, because they seem to be the
      people who squirrel away most of the stuff.
      You wouldn't want to have a pc loaded with
      all these files, you'd have to do your own
      housekeeping. Now here, the housekeeping is
      virtually automatic, and you know, the
      systems people take care of it. And they do
      it in en _masse clean up every 24 hours. Now,
      sure, they can save stuff, they save fif teen
      hundred files per person. But the average
      story length isn't really that great. You're
      looking at it in computer terms. So it
      doesn't make a difference how big a data
      base, an individual pc has. It's the whole
      idea of getting those files to a centralized
      database where the manager can handle the
      data for editorial purposes. So you asked me
      what size database you're really looking at?
      For our size newspaper, now we produce
      roughly thirty pages a day, and we have a
      circulation of about 60,000 daily, 70,000
      Sunday, and we can operate on a one hundred
      megabyte pack. Sometimes, especially around
      the holidays, and things, we get a little
      tight, that's because of ads. But we have
      one system and it has classified, and it has
      editorial on it, and the ideal situation for
      a paper a little bit larger than ours
      probably would be like an RA60, which is

probably somewhere around two hundred and eighty megabytes. That would be ideal. You don't need anything larger than that, unless you're going to do internal library storage. Then with the library system, studies have been done, and you're looking somewhere in the neighborhood of 300 megabytes or 400 megabytes per year for file storage. It's quite a bit when you look at a pc.

Q: Okay. Have there been any other developments and research conducted in readership reaction to the quality of editorial production of your newspapers?

A: Ah, we have, here. We have a sounding board that goes out and listens to the people, and our community is a community made up of over 30, or 40 years old. So consequently, type clarity, picture quality, content, ah, is important to these people, they want to be able to read it. Our type size is...I don't know if you could say, a little bit larger, but it's a little bit crisper than most. And we have to maintain that for our readers, because they get very upset when they can't read it. On photo quality, we could do better. Right now we're doing a lot of our photos on a camera, and you cannot get the quality from a photo from a camera, because you cannot do the electronic enhancements that you can on an electronic system. It has to do with the edges of the dots and the dot quality...

Q: So your readership is aware of stuff like this?

A: Oh yeah.
Q: Okay, I just have one more question to ask you. Are vendors able to meet or relate to the unique way that your newspapers operate?

A: Very much so, we have them in all the time. The vendors, by and large, they think we have a neat operation, I think they'd tell that to anybody, but I always greet a vendor with open arms because I can pick his brains just as much as he picks mine.

Q: Great. Have they had any problems working with the pagination system?

A: No, not really. As far as pagination, it just means that a vendor isn't going to sell as much border tape and that kind of good stuff. But then they sell me a lot of film and stuff. My supplies have just kind of changed.

Q: So I have nothing else I'd like to ask you. Do you have anything else you'd like to add about pagination or any other comment you'd like to make?

A: No, I do say that there is...our system is really antiquated now and it's only eight years old. And eight years old in the newspaper industry years ago, was just in its infancy, but in the electronics industry, we're totally outdated. Sure we've got a really good product, it's a little harder on the technicians because the equipment's a little older. But we are outmoded and there's a lot of neat systems out there, and they're expensive. Today, hardware costs have dropped, software costs have skyrocketed. So, in a newspaper today, they can buy any kind of hardware they want. It's their applications packages that are going to be expensive.

Q: Do you think you're going to do updating?

A: Oh, we'll see a lot of updating being done. We'll be doing some updating, not en _masse. My front end system is just about twelve, fourteen years old and I'd like to update it to a newer style hardware. I was fortunate when we got it, we got very stable, ah, the people who designed had a lot of foresight, and consequently, I'd like to stay with the very same software that I'm using now, but I'd like it on newer hardware.

Q: Thank you very much, you've been very helpful.

3: Deena Greenawald, Phoenix Newspapers, Inc.

Q: Now you're using an Information International III system?

A: Well, it's their NPS system.

Q: Great. Do you think it's economics or
      technology that is pushing newspapers into
      electronic pagination?

A: I think both.

Q: Why do you say that?

A: Well, basically because the technology is out
      there, for one thing. And to keep up with
      the latest and greatest, and tie in with say
      the AP wires and things like that and become
      more efficient, actually saves you money. So
      because the technology is there and available
      and saves you money, and it works, then it
      also is cost-effective to do that, it costs
      something to get into that, and your return
      is not immediate, but once you get your
      system up and running, then it's very cost-
      effective.

Q: Okay, now in the case of your own newspaper,
      why did the Phoenix newspapers install
      electronic pagination?   Were there any
      specific reasons?

A: I don't know of any specific reasons, just
      for the simple fact that I was not here when
      the initial decision was made. They did have
      a certain amount of their process already
      automated. For instance, the classified
      pagination from SII, paginating all of the
      text, and the one-column ads was here. They
      had a RayComp station here which they did
      most of the display ads, the text work on
      there, composing it so it did not have to be
      pasted up out on the floor. So they were
      already moving towards that.

Q: Okay. Did you note a reduction in composing
      room staff?

A: There was no process by which we said, "Okay,
      we now have the pagination, we can eliminate
      ten jobs." Because certain parts of the
      pagination that are in the composing room
      still need to be manned, and by natural
      attrition, because, this newspaper has not
      hired in the composing room in the last five
      to ten years, there was no need to, natural
      attrition had taken care of what might have
      been an overflow. But the newsrooms have had

to add people to accommodate for the pagination upstairs because when the machines were put upstairs to do some of the things that were done in the composing room, the staff had to come from somewhere.

Q: Has there been an increase in quality since the pagination system has been installed?

A: Oh, I would say definitely, definitely. Ah, there are no more crooked columns, no more things falling off. Halftones can be consistent, placing of ads within a page is very consistent. No more of having little pieces all pasted together, so that if something moves in the process of making the film or the negative, you would see it, it all comes out of one complete page.

Q: Okay. As a result of installing an electronic pagination system, has there been an increase in productivity?

A: I would say so, yes.

Q: How would you measure that?

A: Basically, by the decrease in the overtime at the busy times of the year. Because you're no longer doing several things over and over again annually, and they're available to you...(end of tape side)

Q: You said the quality was better...

A: We had our problems getting it installed, getting it up and running, applying the technology to our production. So there were, we had problems where we would lose part of the system, we had crashes, we had things that initially may have worked for a smaller newspaper, but we had to have reprogrammed or readjusted for us. But I would think that that's...In an accounting system, or an insurance system, most of what we saw, with few exceptions was basically because the vendor did not provide what we needed and we had to go back to them. But with those few exceptions we had normal system start up problems.

Q: Okay. Have electronic pagination systems
     helped editorial departments in presenting
     later breaking news?

A: Ah, I think you would get varying opinions of
     that. In theory it really should, because
     just for the simple fact that all they have
     to do is change it on the front end or get
     it off the AP wire and send it across to
     pagination, and as long as the story contains
     the same name or is not reworking an entire
     page, your makeovers are done much quicker.
     The people who actually do the pages say that
     things go much faster for makeovers. And
     some of the editors don't like it because
     they're not as, I don't want to say, in
     control, but they don't have as much hands-
     on as they used to, but they still are the
     controlling factor for the stories and such.
     They just don't carry the physical piece of
     type from one place to another anymore.

Q: Okay, are you saying that the editors have a
     little less control, or just a different kind
     of control?

A: A different kind of control, there are almost
     more hands in the pot right now than there
     used to be. And the editors deal with the
     desk and such, and once the story is done in
     our case it's sent to what we call the
     pagination department or the design
     department. They pull up the stories and
     place them on the page. At the Republic, the
     people in the pagination department actually
     design how the page should look. So in that
     case, unless an editor wants a certain story
     in a certain place in a certain way, it's
     primarily up to the designer, so they don't,
     they aren't doing the paper dummies like they
     used to. On the other newspaper, they're
     still doing it. So we have both.

Q: Do you think pagination has helped improve
     readership?

A: Oh that's a tough question, I really don't
     know. I really don't think that unless
     somebody knows somebody who works here, I
     don't think readers really know that we're
     paginated.

Q: Okay. After installation of an electronic
     pagination system, has there been any change
     in your newspaper toward opening up some
     pages to advertisers who cannot afford a full
     press run, or to offer any other kinds of
     tailored information products?

A: Oh, that's a hard one too. I honestly don't
     think so. I think there were always things
     that we did. We run different special
     sections and things for, you know,
     specifically for advertisers, let's say
     wedding people, who wouldn't advertise every
     week anyway. So I don't think that's really
     changed. I think we pretty much accommodated
     those people to begin with.

Q: Okay. Do you have a system with the full
     capacity for an integrated pagination process
     for combining news text with ads and
     graphics?

A: Yes

Q: Do you do full computer to plate?

A: We do full computer to film right now, I
     should say, to RC paper, and the negatives
     are made from that. We will be in the very
     near future going direct to negative. I
     don't feel that the technology for direct to
     plate is cost effective.

Q: Okay, great. But you are combining stuff
     like line art and half tones?

A: Oh, yeah, in fact the Republic, the Phoenix
     Gazette, the Arizona Business Gazette, are
     fully paginated. Everything comes out that
     belongs on a page, out together. Nothing is
     pasted up. The only thing that we do some
     paste-up, we will again, in the very near
     future combine this, is mechanical color,
     because there's really no reason to have two
     pieces of RC paper come out, you still have
     to strip the negatives. As soon as we can go
     direct to negatives, we will do full
     mechanical color, too. So we have half
     tones, line-art, display ads, camera-ready
     ads, editorial text and advertising text
     fully paginated.

Q: Great. Is computer-to-plate pagination the
    best, and does it meet the necessary criteria
    of being both practical and cost-effective?

A: I think in the near future it will be, I
    don't think it's there right now.

Q: It still has a way to go?

A: Yeah, the computer-to-plate, I think the only
    people that are doing that, and I don't know
    if they are still doing it, is ah, Dow Jones.
    And a lot of that is things that they
    developed on their own with the vendor.
    They've got Triple I also. They developed
    some things inhouse, on their own and they do
    it for a certain reason. We were going
    direct to plate from our facsimile. We have
    a remote plant, and were going from the RC
    paper direct to plate. But because of
    changes and things like that, at the time,
    and the technology, and the facsimile that we
    currently have, it's not cost-effective for
    us. I don't know what Dow Jones's feelings
    are on this, but I think they are one of the
    only ones who do that at all. And it would
    be the Dow Jones that is in Florida that's
    doing it.

Q: Have there been further steps in technology
    recently for the newspaper industry? And to
    what extent will personal computers play a
    role in producing a newspaper?

A: Yes I think there are further steps. You
    know the vendors that are in the pagination
    business are bringing out new products all
    the time. Right now Triple I has what's
    called a laser setter, and we're looking at
    that for our remote sites, and it will enable
    us to go direct to negative. And there are
    some other things. Now as far as the pcs,
    the things that I have seen and read about
    are more on the scale right now of a smaller
    newspaper. It may be in the future, the same
    thing with desk top publishing, if you want
    to lump them all together, that in the next
    five years let's say, there will be stuff
    that will enable us to use those better for
    the larger newspapers. You know with the new
    IBMs that have the thirty, forty, and seventy
    megabyte storage. Software, I think

eventually will be there, but I wouldn't say in the next couple of years, from what I've seen in the Phoenix newspapers.

Q: Have there been any other developments and research conducted in readership reaction to the quality of editorial and production of newspapers? Have you done any surveys as to how your readers feel about pagination?

A: Off hand, I don't know that answer. I, as a subscriber, have not seen anything in my newspaper. That's not to say that we haven't. I know that our public relations department keeps close tabs as to what we're doing with pagination, but whether that is reflected to the readers, I really don't know.

Q: Okay. Are vendors able to meet or relate to the unique way that your newspapers operate?

A: They are starting to. It has taken them a little while, just for the simple fact that although they've been in the printing industry for a long time, a lot of these vendors, they have not been in the newspaper industry. It is so totally different, and the time requirements and the speed requirements, things like that, I don't think they really understood it till they actually got their hands into some newspapers. But they have gotten a lot better and are a lot more responsive, and a lot more, have a lot more idea of what we're actually looking for.

Q: Okay. Well, I don't have anything further to ask you, do you have any other comments you'd like to make about pagination?

A: No, except that I'm very glad that you called us, because we just got a thing over the wire a couple of days ago, on the AP wire. It was an announcement about the Baltimore Sun, and their future pagination, and one of the paragraphs that the reporter wrote in there was that, if it is successful when it is complete, that Baltimore will be the first fully paginated newspaper in the country. And we were quite offended by that, because we've been doing this for about, ah, the Republic's been up and paginated for about

oh, two years now. And the <u>Gazette</u>'s been up for at least a year. We've been in this for three years and we did it in stages, but you know, we go to the trade shows, ANPA, and some of the other ones, and it seems like everybody from the East coast forgets that Phoenix even exists. So we hear things like "Nobody except Philadelphia," or somebody east of the Mississippi, is doing this.

Q: Well, I had actually read that Phoenix had pagination, so somebody is reporting on it.

A: Well, Seybold seems to keep up with developments pretty well, but I'm not so sure that everybody reads them because they're such a tech-y magazine, that you get bogged down in trying to figure out what the heck they're talking about, that you miss half the article. Half the people who read that, just want to find out what's going on, and really don't care, or would like to find a way to skip through all the technical stuff.

Q: Great. Thank you very much.

4: Mike Shibuick, <u>Florida Today</u>.

Q: So you're using a Hastech system?

A: Right.

Q: To what extent do you believe electronics and or technology are pushing newspapers into electronic pagination?

A: Well certainly, on the economics side, it's no economical to go with paginated newspapers. You just replace one with the

other.   You remove past-up people, and you replace
them as editors on Hastech terminals.

Q: So you don't believe it's been economical.

A: No, I don't believe so.   You're talking just
general photocomposition.   In other words,
offset has already been in gear.   You're
taking guys that typically used to galley
paste-up, they're not doing that any more.
What you've done is you've replaced those
paste up people, and now put an editor on a
Hastech terminal.   Now that page takes longer
to produce.

Q: Longer?

A: Sure.   Because they manipulate the pages
longer, they change stories, they have
increased deadlines.

Q: So what was the reason for installing your
electronic pagination system?

A: I wasn't there when they did it.

Q: Do you feel that the quality has been
increased?

A: Ah, yes, you could say that.   It's because
you don't have the paste-up deficiencies any
longer.   It's all done mechanically,
electronically.   So the quality is increased
somewhat.   Ah, when you do makeovers now,
instead of just setting a galley, a column,
or a cut line, the whole page is done over.
So in some cases, you're outputting a page
two or three times.   Your typesetting paper
has gone up dramatically.   You still can't do
halftones and graphics.   So the only thing
we're paginating is type. Halftones still
have to be put in manually.   I mean that's
the ideal goal, if they could put in half-
tones and put in the graphics
electronically, where we could come out with
one complete page that goes to camera, then
it's doing something.   But right now, you
know, it's a good system, we like it,
probably wouldn't trade it for anything else,
but it hasn't really saved us any money.

Q: Okay. So as a result of installing your
       system you don't feel there's been an
       increase in productivity?

A: Ah, I wasn't here when they installed it, so
       I don't know what they did before, they might
       have had seventy compositors, and therefore
       they axed out forty of them, so yeah, if
       that's the case, there was. But they did not
       need seventy compositors in the old days.
       They only had them on because they were
       coming out of hot metal. So can you say that
       if you took somebody who's doing galley
       paste-up now or doing what we call butt
       slugging, then I don't believe you're going
       to gain that much in the productivity and
       efficiency part of it. It's hard to, you
       asked a tough question. If you're coming out
       of letterpress, and you went to pagination,
       yes, it's going to be very, very helpful.
       But if you're already doing offset on an Atex
       terminal, or on some kind of system that you
       can do semi-pagination, and a lot of them
       will, you can set a whole half page, you
       know, and butt slug the whole system
       together. We used to do that at USA Today,
       come off of Atex terminals, do half page
       pagination and butt slug the copy. We only
       had seven paste-up people, and four part-
       timers. So we did not have a lot of
       compositors. And now I've come down to
       Florida Today, I still don't have a lot of
       compositors doing the news pages, but they
       have a lot of people on the Hastech terminals
       in editorial. We have ten Hastech terminals,
       that means ten people to make up pages.

Q: So you came to Florida Today from USA Today.
       Do you feel that the system at USA Today was
       more advanced than the one at Florida Today?

A: No, it's the same system. We have Atex
       Hastech, okay? Atex terminals for inputting
       copy, and Hastech terminals for pagination.
       At USA Today, they only had Atex terminals.
       They did not have news pagination. Now they
       were getting into Atex's news pagination when
       I left there. And I don't know whatever
       developed out of that. But at the time, when
       we were coming straight off of Atex
       terminals, we still only had a limited amount
       of composing room staff, who did all the news

paste-up, plus the little bit of advertising that they did. Most of the ads came in camera-ready. Well if you take those eleven people, and they could do that just with an Atex terminal, and then you come to a place that has pagination, such as _Florida Today_, you don't have, we only have three compositors to do news paste-up. But there's ten people out in the editorial department to manipulate those pages on Hastech terminals. So give me those ten people, and I could paste up those news pages for you, very quickly. So the question you asked about economics? It's hard to say. In my opinion I would say it has not really driven it that much compared to one newspaper who is currently doing photocomposition, or pagination.

Q: Okay. Do you think there's been savings in material costs?

A: No, there again, now instead of just setting a cut line because there's an error in the cut line, the whole page is re-set. So, you're probably out putting more.

Q: Okay. Any increase in problems because of electronic pagination?

A: Nah, nope. You know you've got more equipment to maintain, but that's about it. I don't see any problems with it. Now, they're heading in the right direction. Like I said, if you took the graphics, and you could get halftones in here, and we could paginate a complete page, bypassing the composing room, and just going right to camera, then it's a viable option. But just to do type pagination, you know, it hasn't been really that successful in my estimation. It's steering in the right direction, you've got to have a portion before you can eat the whole elephant, you've got to start with the tail so that's what we're doing.

Q: There have been some papers that have done complete pagination...

A: Phoenix has a good project going, but that's the only one that I know of that's trying to do the total pagination system; there's

another one I think in New Jersey, trying to
get with another company. The other two
newspapers in Gannett, the only two that are
close is Cocoa, and Westchester-Rockland.
Ah, Westchester, there again, how do you
compare the economics of it? They had a lot
of printers when they were hot metal, they
converted to cold type and they carried a lot
of those printers. They had buyouts and
things like that, but they're still dropping
some printers off today. But they could have
done that probably with an Atex system with
no pagination. Pagination on the ad side
though is much better. You can do more
things with an ad terminal than you can with
an editorial news terminal. You know, you
can draw circles, you can create designs,
create square blocks, but of course,
Editorial doesn't have to do all that.

Q: Do you think that electronic pagination
     systems have helped editorial departments in
     presenting later-breakiag news?

A: Ah, I'm not sure. You know there again,
     before you used to output it, you'd typeset
     it, and then slam it into the page. Now you
     got to typeset it from an editor's
     standpoint, they've got to put it into a
     Hastech terminal. The person has to
     manipulate it to see if they can cut it, or
     if it fits. If it doesn't fit, they've got
     to go back to the editor that wrote it, have
     him rewrite it. He has to come over and edit
     it. And it's all done on a machine, and
     that machine will only move as fast as it
     wants to. Where if you're on deadline with
     something, a person typically could move a
     lot faster. And I know that we could paste
     up a column of copy for a late story, faster,
     if it just came out of the Atex terminal.
     Does it sound like I'm down on pagination.
     That's not what I'm saying.

Q: I understand what you're saying. You don't
     think it's that much faster than cold type.

A: No.

Q: Okay. Do you think it's helped improve
     readership?

A: Ah, I don't know how it would. If you reproduce two pages, one on a pagination system and one by galley copy it would look the same in the paper the next day. It's the same type it's just formatted differently in the composing room.

Q: Alright. After installation of an electronic pagination system, has there been any change in your newspaper toward opening up some pages to advertisers who cannot afford a full press run, or to produce any other kinds of tailored information products?

A: Ah, I would say not. We've opened up pages, zone pages but not because of pagination. We just do it because that's the trend.

Q: Do you think pagination facilitates that, or it's just that you would have found a way to do it anyway?

A: Probably would have found a way to do it anyway. You see, we still lock-in the same ads, the same hole. If you were doing it manually you would lock-in a hole and say, "I'm either going to drop in a story here, an ad, or I'm going to drop in three different ads. But we're not going to change the size of that page, and that's the same way with pagination. Maybe pagination can do it a little bit better, a little bit easier, but we don't push it.

Q: So you don't have a system that does full pagination, with integrated text news, ads and graphics.
A: No. We only do the body copy for the news pages. That's it.

Q: You do have a pagination system for ads?

A: Yes, Adpro. Hastech Adpro.

Q: Is computer-to-plate pagination the best, do you feel? Will it meet the necessary criteria of practicality and cost-effectiveness?

A: If they ever get it working. I mean, in 1973 I heard that 'we got it', you know, '"we're going to go computer-to-plate', and that was Crossfield. W e were the first newspaper to

prototype it (at Army Times), so I grew up on the ground floor of this pagination with computer-to-plate, and it's never worked, then or now. That was a long time ago.

Q: Do you think they've come a long way?

A: Do you know anybody who's using computer-to-plate?

Q: Well the only people I've talked to so far who said they were completely paginated was the Phoenix paper. Utica said they had it, then dropped it.

A: No, Utica's not computer-to-plate. They're not even close. Phoenix is not computer-to-plate. They might have a bigger stand on pagination, but I'll bet they don't go from computer-to-plate. If we had all text and no graphics, we could go computer-to-plate easy.

Q: Mostly everybody goes to RC paper first. So have there been any further steps in technology recently for the newspaper industry? And to what extent will personal computers play a role in producing a newspaper?

A: I think they'll play a major role for small newspapers. You can see that today, you can even see it in the ad design. You know small ads, probably ad reps will be coming in and instead of drawing up a layout and submitting it to a composer, they may go over to a pc and set their own copy, set their own ad.

Q: That's an interesting concept. Have there been any other developments and research conducted in readership reaction to the quality of editorial and production of newspapers?

A: Yes. We ran a survey last year, and we're running one again this year. As far as pagination, I don't think the reader even knows the difference.

Q: So you don't think they can tell.

A: No. They just look at style, how much news
    you have, what kind of news you have.

Q: Do you think they're generally aware that
    you're using a different system?

A: No. I don't believe so.

Q: Okay. Are vendors able to meet or to relate
    to the unique way that your papers operate?

A: That depends on what we're trying to do. If
    we're asking for color separation system,
    they can do that. If we're asking for them
    to paginate color, they can do that. If its
    putting halftones and graphics into text,
    they can't do that. You know, some areas
    they can accommodate us and some areas they
    can't. And we're just sitting back waiting
    for somebody to say, "okay we have it, it
    works, we can take halftones, graphics,
    combine them into the paper, and output it."
    We'll look at the system, if it's viable,
    we'll purchase it. If it's not, we won't.
    Everything has to have an ROI. You know, if
    you're not going to save anything, or
    increase your speed with this new piece of
    equipment, it's not worth getting.

Q: Okay. I don't have any other questions to
    ask, do you have any other comments you'd
    like to make about pagination?

A: Nope, I don't think so. I hope I answered
    the questions.

Q: Yes, you did. Thanks a lot.

5: Peter Romano, ANPA

Q: To what extent are economics and or
    technology pushing newspapers into electronic
    pagination?

A: Pagination is, you know, a goal that they're
    all striving for, and they have for years and
    years and years. Going back to the con-
    sortium with IBM, called the Newspaper
    Systems Development Group. Ah, that was
    maybe premature, ahead of it's time, ahead of

technology I think. And the problem there was, it was a noble cause, but it went down the drain.

Q: Yeah. Do you think that's because they started too soon?

A: Yeah, they started too soon, and it was such an involved project. A newspaper is a very difficult publication to paginate because it depends on newspaper philosophy. There are no real standards in newspaper paging. Newspapers are putting out a new product every day. The product is actually changing in between editions. So there's no set format similar to a magazine. In a magazine, your stories start in the front and all jump to the back. In a newspaper, you may have jump pages all over the paper. So what you're talking about is closing up, when you close up the front page, you're not only in a time critical mode, you're also affecting those pages that might be influenced by stories that are continued on other pages. So it's a very difficult thing, pagination for newspapers. I think one of the problems, one of the things that's really been inhibiting pagination, and when I talk about pagination,I'm talking about paginating the entire contents of the newspaper. That means text, halftones, graphics, the whole works. In that sense then, when you start talking about paginating a halftone, you're talking about a lot of information, a lot of storage. And I think that's been one of the problems. I think one of the things that will probably break this deadlock, is the fact that computer memory cost has been going down drastically. I think I read somewhere that if the price of automobiles had gone down in the same ratio as computer memory in the last fifteen years, you could buy a Rolls Royce today, for a dollar. So I think with the new memories, the new chips, I think one of the things that will probably break it wide open, is the erasable laser disk. That has tremendous potential, it has enormous storage capacity.

Q: Do you think that newspapers need a lot of storage capacity?

A: They do, they do. Particularly if you're talking about halftones, you're talking megabytes now, and I'm referring to photo-graphs. I think we're moving along fairly well, newspapers are, it's been a long drawn out process, but I think within the next five to ten years, you'll see pagination systems not only for the large newspapers but also within the reach of the medium sized to small newspapers, at a price that is afford-able. But that's because of computer developments in memory.

Q: Okay. Now as a result of installing elec-tronic pagination systems, do you think in general there's been productivity increase?

A: That's a moot point. Yeah, there have been, the newspapers have reported that there have been. But the thing is, you see, again, you have to define pagination. Again I go back to paginating electronically an entire page, storing it in the computer, and outputting it as a complete page, with every element in its proper place. So, that becomes a pretty complicated goal. Now if the front page or the pages in the newspaper, if the ads are all in the same place, and it's more or less a standard format, that would be fine. But as I say again, newspapers change their content every day.

Q: You know it's a funny thing, I just realized that perhaps when pagination was new, everybody was saying, 'Well this is going to save like fifty or sixty percent in production', and then maybe a lot of people were still doing hot type then. I just spoke to a gentleman before I called you who insists that they haven't had any increase in productivity because of pagination, because they were already doing cold type. And I wonder if because, maybe, everybody switched over to cold type, or most people...

A: Well, in newspapers it's virtually one hundred percent. I mean people...one of the big advantages, years ago, we did some cost analysis, trying to figure out, you know, where were the big cost centers in news-papers. And in most newspapers, particularly in the medium to large sized newspaper, the

biggest cost center was newsprint, the cost of the paper. Obviously there was nothing that could be done with newsprint, to improve its quality or its performance without being strongly flavored by economic factors. So the second area that we looked into was the composition, which was the second large cost area, and at that time, everything was hot metal. This is where the real savings came. You know at one time, in order to produce an ad, you might need two or three hot metal linotype machines. Now you can do it all on one machine, and do borders, you eliminate all that metal carpentry, and actually reduce the work force, to be honest with you, significantly. The front end systems that we introduced back in the late sixties, VDTs and OCRs, that gave us the opportunity of getting into the newsroom and making that more efficient, and also eliminating the redundancy in producing type before it actually became hard copy. So the big nut, the big savings was in composition, combining the editorial input with the cold type, and the VDTs. From here on in, you know, the savings become...we've taken the cream off the milk. Any savings that are accrued, are going to be very minimal.

Q: So there aren't dramatic changes to be seen?

A: Well, you know the latest thing which is now entering newspapers and is really coming from,..newspapers started, believe it or not, the VDT revolution. In other words, when people were talking about word processing, in the last five years, newspapers were doing this starting in the late sixties. That was nothing new for us, and newspapers were developing through manufacturers proprietary electronic editing systems in essence for years. And they're common place in almost every newspaper in the country. Now, comes the pc revolution. And that's what's hitting newspapers now. However, this revolution is coming from outside the business, into the business. In other words, it's coming from the computer world. And it's no longer generated from inside as the front end systems were. This now causes us to say, okay, they have tremendous capabilities, the pcs, and there's a lot of programs. The

important thing is that they're operating on
a standard operating platform. In other
words, they're interchangeable. You can put
an Apple with an IBM, you can do all kinds of
tricks. but they're all basically operating
on a standard platform. Before what you had
was proprietary. If you had an Atex system,
the software, the equipment was provided by
Atex, but not compatible with say, SII or any
of the others. But now with a standard
operating platform, there is some kind of
standardization. I think that probably is
the key to the electronic pagination, having
the interchangeable software, whether they
have mainframes or not. It will actually
lead to the final development of pagination
to the point where it becomes feasible and
economical. The question in my mind, is if
you were to buy, let's say, an Apple system,
or get a bunch of Apple pcs, you run down to
your local Computerland store, and they've
got all sorts of programs, but when you go
back to them and you say, "I'm having trouble
with my classified," and he says "What?
What's a classified, what's a newspaper."
They're really not designing for newspapers.
They're designing for the computer world.

Q: Well, do you think that's because the
      newspapers haven't really ah, demanded such
      software?

A: Well, to be very candid, I do not think that
      newspapers represent, you know if you look at
      the overall computer market, I do not think
      that newspapers represent a significant
      portion of that market. You've got what,
      some sixteen hundred and fifty some,
      newspapers. That's not a big market.
      Especially when you think of all the pcs that
      are being used for everything and anything.
      So it's a minimal part of the market. You
      know we're not in the catbird seat any more
      where we can say, 'Hey this is what we want'.
      I think what you're seeing now is the
      emergence of software companies, that are
      putting together these so called cats-and-
      dogs, and making them compatible with each
      other, in other words writing the interfaces,
      the programs that are required, specifically
      for newspapers. I think the most significant
      thing are the capabilities of the pc

graphics. And that again is an important
tool in electronic pagination. So the
Chicago Tribune is putting in a big system,
with Seatex. The New York Times is putting
in a humongous system, I think it's Atex and
IBM, but again pc-based. So you're beginning
to see companies coming in and putting
together newspaper pc systems. So that
really will probably break the deadlock that
we've had on electronic pagination. Not only
will it provide enormous storage capa-
bilities, also economically, it makes it a
lot more feasible. With some of the original
newspaper pagination systems, you were
talking two, three million dollars. Very
expensive.

Q: Do you think there's been any increase in
problems because of electronic pagination?
A: In what sense?

Q: Whatever, production problems or just
compatibility problems with other ways of
operating.

A: No not really. I really think it's been a
boon to newspapers. I remember when we were
running an electronic editing seminar, and we
were introducing VDTs to editors and newsroom
people, and it was WYSIWIG, what you see is
what you get. You can't blame the guy down
on the stone; if there's a typo, it's your
fault. I think that's put the control back
into the newsroom, and I think newsroom
people and editors are very comfortable with
screens, and inputting. They can do all
kinds of tricks with them. They become very,
very proficient. In fact we really started
going when they got involved. They said,
'You know this is what we need'. Then we
started talking to the vendors. There was a
communications gap. The editor would say,
'This is what I would like to do'. And the
vendor would say 'Oh, I did not know you
wanted to do that. We can arrange that for
you. We can give you graphics, we can give
you all kinds of tricks'. So that's part and
parcel of it. You must remember that news-
papers are coming out of an environment of
tailored systems. They were tailored speci-
fically for each newspaper. Let's say you
had two newspapers, 50,000 circulation each.

Outwardly they look the same, but inwardly they're not the same. Front end system companies were in essence, reinventing the wheel every time they sold a system, so that meant a lot of programming effort. In the future, everything will be operating on a standard platform, and the software interface will be done probably by a software company, and I believe in the long run, it's probably going to be those companies that have gone through the trauma since the seventies, that have learned exactly what the newspaper needs are. They were a little reluctant in the beginning, because they had proprietary software and hardware. They were a little reluctant, in fact they spurned pcs. Now they're all getting aboard they realize that we have to do this. They call it the fourth wave.

Q: Probably conversion to SAU (Standard Advertising Units) is going to help also.

A: Yeah, that's something we did with the Bureau and Four A's (American Association of Advertising Agencies) a number of years ago, and that helps also. That actually helps pagination, you're right. It's a move towards standardization, which newspapers never really had.

Q: Okay. Do you think electronic pagination systems help editorial departments in presenting later-breaking news?

A: They should, they should, yeah. If you have your information stored electronically, its easily manipulable; in other words, you can go to the last minute in making your changes and it's a case of again, electronic pagination also will lead you to eventually plateless printing. You know we demonstrated plateless printing, we used MeDigit in about 1976, and we demonstrated, we only used one column of a newspaper, but we used that column to demonstrate ink jet printing. And what we were able to do is to change that column as the press was running. So if you want to get any more late-breaking than that...Theoretically you could produce a copy for each subscriber with plateless printing, because it's all stored in elec-

tronic form. What people did not realize at
the time was that in order to do this plate-
less printing, whether it be laser printing
or ink jet printing, that you must paginate,
you must have electronic pagination one hun-
dred percent, it must be resident in the
computer, to output it to control what-ever
means you're putting the image on the paper.
So electronic pagination is the missing link,
and you need that in order to go to the next
step which is plateless printing. We had a
publisher coming into this demonstration room
at a conference, to give you an example. I
said to the guy running the computer termin-
al, 'That's Jim Knight of Knight Newspapers
(at the time). Why don't you welcome him to
the demon-stration?'. And by the time he
walked across the room past the folder, they
handed him a copy of the paper and that
column had been changed to read 'Welcome Jim
Knight', at the MeDigit/ANPA demonstration.
I mean that's the potential, but again the
missing link is total pagination. So I mean
you can manipulate, you can late-break, you
can do all kinds of tricks.

Q: Do you know of any papers who are using total
pagination yet, including combining line art
and half tones?

A: Yeah, there's a number of papers, again I
wouldn't want to be quoted, but there's a
number of papers that claim that they have
it, but whether they have it one hundred
percent, I doubt it very seriously. They've
got it up to a certain point. But Pasadena,
I think has it, Phoenix has it,
Westchester-Rockland Newspapers. There's a
number of newspapers that have pagination
systems.

Q: Do you think that computer to plate
pagination is the best? Will it meet the
necessary criteria of being practical and
cost-effective?

A: Oh definitely. Computer-to-plate? Yeah, and
the next step from that would be computer-to-
paper. I think you'll see that with the ad-
vent of the erasable laser disk. We've been
looking at some possibilities with the
erasable laser disk, where you could actually

put the image right on the press cylinder, and then after the run, just cleaning it up, demagnetizing it. Using a laser printer's not a heck of a lot different than today's paper printer.

Q: Okay. What do you think are the trends for the future? You mentioned the laser disk.

A: If you want to get real futuristic, you're talking about total pagination, going into a computer, outputting it directly onto paper, I'm going way out. Electronic cameras are now beginning to come in;at the moment the resolution is not what it should be compared to conventional halftone methods, but the electronic camera has a lot of possibility and it's being used to some extent right now. I think AT is using some electronic input, where you stop-frame a picture on a TV. SONY's working on it, Canon's working on it, Kodak, there's a number of companies that are working on the electronic camera. We demonstrated at a conference last year or the year before, where a reporter in the field could take a photograph with the electronic camera, which is about the same size as a conventional 35mm camera or slightly bigger, and by going to a telephone, he can transmit with an interface, a coupler, that information right into the newspaper computer. Then they pull it out and manipulate it, and produce separations if it happens to be color, or negatives if it happens to be black-and-white.

Q: That's pretty wild, right from a camera?

A: Yeah, and they just capture it on a little magnetic disk. We have the camera here, we've been working with SONY and some of those other companies. The only problem at the moment is that we don't quite have the resolution that is par with good newspaper halftone reproduction.

Q: Okay. I just have one more question to ask you and that is: What does the ANPA plan for the future, as far as the next few years go?

A: Well there's not a lot that we can do. Well we've got a computer task force that's

looking into all the different parameters
required for pagination and transmission
standards with wire services, with photo-
graphs and the whole works. We started a
committee where we got some standards, wire
copy is an example. At one time, depending
on what service you had, you spent all kinds
of computer memory just trying to identify
the different parameters given by the dif-
ferent wire services. Now we were able to
get the wire services together, and we still
have that as a standing committee, we came up
with common codes, common headers and guide-
lines. We had certain field designators that
were common among all wire services. Now
there is standardization. Now we're working
with IPTC, International Press Telecommu-
nications Committee. This group is working
on international standards, and we're working
with them also. This has to do with interna-
tional transmission by satellite and other
means. The other thing we've been involved
in is the ADSAT network, satellite trans-
mission of advertising. Very simply, they're
a company in New York City, that offers ad
transmission from primarily national and
regional retail advertising people. Say you
want to send an ad to fifty national news-
paper markets. If these are part of the
ADSAT network, the copy is sent from a
central point such as New York City Chicago,
or Los Angeles, via satellite to those fifty
newspapers. They have an electronic key that
will only allow the newspapers that are in
the campaign to receive the copy. In addi-
tion there's a message center which operates
on a pc, by which the network can actually
communicate with a newspaper and vice versa.
This means that if there's a snowstorm in Des
Moines, and Firestone wants to run a snow
tire ad, you can almost get it out the same
day.

Q: It sort of reminds one of a satellite version
      of coop advertising.

A: Yeah.

Q: Thank you very much.

6:    John Hovde, Production Director, <u>Minneapolis Star & Tribune</u>

Q: To what extent are economics considerations and or technology pushing newspapers into electronic pagination?

A: Well the system gave newsroom more control of the product, and also there was the economics of saving labor in the composing room.

Q: So did you find you had a reduction in composing room staff?

A: Yes, it vastly cut down on the page makeup time.

Q: How about quality, did you find it was increased?

A: Ah, I would say yes.

Q: Okay. As a result of installing the system, has there been an increase in productivity?

A: Yes.

Q: How do you measure that?

A: Well I think we can produce more pages in a shorter period of time.

Q: Has there been a savings in material costs?

A: Yeah, there was some savings in RC paper, you get a more exact fit outputting by the full page rather than by the column.

Q: Could you make any estimated percentage of savings?

A: No, offhand I could not.

Q: Have you noticed any increase in problems because of the pagination system?

A: No, actually, we've virtually had no problems with it. I think that it's eliminated some problems. If you get the wrong turns for example when you do it by hand, under a pagination system it's much more accurate.

Q: Has electronic pagination helped your
    editorial departments in presenting later-
    breaking news?

A: I'd say yes.

Q: Okay. Do you think it's helped improve
    readership?

A: Well, I haven't seen any surveys on it, but I
    would say yes, because I think there's less
    errors.

Q: You think the public notices stuff like that?

A: I think so.

Q: After installation of an electronic pagina-
    tion system, has there been any change in
    your newspaper toward opening up some pages
    to advertisers who cannot afford a full press
    run? Or to produce tailored information
    products?

A: No, we were already doing that before.

Q: Do you think pagination has helped to make it
    easier, or not made any difference?

A: Well I think it makes it easier for the
    production process, because it's easier to
    output all those pages. It was a pretty
    labor-intensive operation before.

Q: Do you have a system with the full capacity
    for an integrated pagination process for
    combining news text with ads and graphics
    (i.e., line-art and halftones)?

A: No we don't, not at the current time.

Q: How close do you think you are?

A: Well our long range goal would be to do that,
    yes. But that's down the road a way yet. It
    would involve some equipment changes as well.
    Right now we're in the process of installing
    a new Iconics color system, that we've got
    into production, that will be tied in with
    Atex. That will be one more step in the
    right direction.

Q: Okay. Do you think computer to plate
    pagination is the best option, and do you
    think it will be practical and cost-
    effective?

A: I really don't have any sound basis to give
    you an opinion on that. We tried going
    strictly from paste-up to plate about five or
    six years ago. While the process did work,
    the idea there was that you could eliminate
    all the film in between, and go directly from
    paste up to plate. And we're talking here
    from computer-to-plate. Obviously there's
    some real cost savings in there. Do I think
    it'll work? Yeah, eventually.

Q: Of course, they've been working on it for
    twenty years now.

A: Yeah, I don't think it's right around the
    corner.

Q: Have there been further steps in technology
    recently for the newspaper industry? And to
    what extent will personal computers play a
    role in producing a paper.

A: Well, I think you're going to see, more and
    more, a bigger role for them. We, right now,
    are pretty much dependant on our Atex system,
    but if you read the Seybold Report, you'll
    see that there are a lot of papers that are
    doing their whole front end system with
    personal computers tied into the mainframe.
    We are using some Macintosh's and some IBM
    pcs, but just about all of our work outside
    of graphics, which could be done on a
    Macintosh, is done with the Atex.

Q: Have you conducted any research or done any
    surveys relating to readership reaction to
    your pagination system?

A: I know that we do a lot of surveys, but I'm
    not sure they were ever directed directly at
    pagination. I don't think so.
Q: Have you noted any reaction to pagination by
    readership at all?

A: Well I don't get as many complaints about
    wrong turns or jump pages being wrong, or
    things like that, as I used to. So I would

say that's a direct result of pagination.

Q: Are vendors able to meet or to relate to the
      unique way that your papers operate?

A: Oh yeah, we've had good response from the
      vendors.

Q: Great. Okay, I don't have any further
      questions. Do you have anything you'd like
      to add about electronic pagination?

A: Well I think it's worked very well. We
      started out with paginating our classified,
      and then also our news pages. We've been
      very happy with both of them.

Q: You mentioned that you were planning to up-
      grade some of your equipment. Do you think
      this will happen in the near future?

A: I'd say within the next three to five years.
      We're going to have to do some upgrading of
      older equipment, especially the photocom-
      positors, to upgrade screening and re-
      solution. That will be a major cost
      investment.

Q: It seems like the newspaper industry has been
      subjected to a lot of change in the last
      couple of years, where before they had no
      change for a long time.

A: No, for many many years, nothing changed.
      It was just, go hang it out on a Linotype
      machine or an Intertype, and everything
      stayed pretty much the same. When computers
      started entering the newspaper business, you
      changed drastically, very quickly.

Q: Well thank you very much.

7:    Glenn Dunn, Production Superintendent, Lawton
      Publishing Company [OK])

Q: Was it economics or technology that in-
      fluenced your decision to implement the
      Xenotron?

A: Ah, technology.

Q: Did you install it for economics, labor, or
     quality, or all?

A: I think quality was the main thing, also the
     speed.

Q: Did you find you had a reduction in composing
     room staff?

A: I don't think so. I think that was possibly
     one of the first thoughts of publishers, but
     I don't think that's happened here.

Q: You did not install electronic pagination
     directly from hot type?

A: No, we went to paste-up first.

Q: As a result of installing your electronic
     pagination system, has there been an increase
     in productivity?

A: Yes, better quality and quicker output.

Q: Have there been savings in material costs?

A: No. That depends. I would say no, because
     on the electronic systems you have to run
     your wide film in, whether you want to or
     not, and if you've only got one column to
     make, you're wasting a lot of film.

Q: Has there been any increase in problems
     because of electronic pagination?

A: No, not really.

Q: Have electronic pagination systems helped
     editorial department in producing later-
     breaking news?

A: Yes.

Q: Has it helped improve readership?

A: Yes, I think the quality is much better now,
     it's more evenly spaced and everything, and
     there's no chance for crooked stuff. I think
     it's better all around.

Q: After installation of an electronic
     pagination system, has there been any change

in your newspaper toward opening up some
pages to advertisers who cannot afford a
full press run? Or to produce tailored
information products?

A: Not that I know of.

Q: Do you have a system with the full capacity
for integrated pagination?

A: We've got the system, and part of it's still
being developed. All of the software is not
completed on it yet. We do have the
machinery though.

Q: So you're not combining line-art and
halftones?

A: Oh yes, we are. What I'm talking about (for
the future) is a full blown system, where the
ads flow into the page, and the whole bit.
We're doing all of editorial, it's complete,
pictures and all, and then the ads, we paste
them on separately. They are done on the
machine, but it's a separate electronic unit.

Q: But you go computer-to-paper?

A: Yes.

Q: Is computer-to-plate pagination the best do
you think?

A: It's coming. I'd say it's ten years down the
road.

Q: Do you think it will be practical and cost-
effective?

A: Well, there's always going to be some pro-
blems, national advertising and slicks and
stuff, you've got to get into the system, and
that's where the main crunch is right now,
getting that big a thing scanned in. That
takes an awful lot of memory. The storage
capacity is a problem.

Q: Have there been further steps in technology
recently for the newspaper industry, and to
what extent will the personal computer play a
role in producing a newspaper?

A: We're looking at personal computers on the
front end system, I think they're the coming

thing. I think they have their limits.
There's no comparison with a personal com-
puter and an XVC work station.

Q: As far as being compatible with your
    operations?

A: Right, the quality is just not there. You're
    looking at the difference between 1009 re-
    solution, and 309 resolution. Pcs can only
    handle so big a page size too. 8 1/2 by 11 is
    about their limit. We need 13 by 21 1/2
    broadsheets. But for a front end system,
    having personal computers for storage for
    editors, I think that's coming. Definitely.
    In fact we're looking at a system right now,
    a Triple I. We've had ECRM.

Q: Have there been any other developments and
    research conducted in readership reaction to
    the quality of editorial and production of
    newspapers. Have you conducted any surveys
    as to reader reaction to pagination?

A: None that I'm aware of.

Q: Do you get any kind of response from your
    readers on pagination?

A: No, not on pagination, I don't think so.
    Except that whenever we change our style or
    format, we get Letters to the Editor.

Q: Are vendors able to meet or to relate to the
    unique way that your newspapers operate?

A: I think that a lot of the vendors are hurting
    right now, and the newspaper supplies, like
    film and wax and overlays for dot structure
    of halftones and stuff. The electronic
    displays have done away with their materials.
    Now if they don't get into computers they're
    going to really be hurting. Now there's a
    lot of job shops out there that still use
    their products.

Q: Now as for the vendors that supply your
    electronic needs, do you find that they are
    able to handle your deadline requirements or
    other special needs.

A: Well, Xenotron's real lousy on that. They're
    slower than a seven year itch when you've got

a problem. We pretty well maintain our own
stuff around here. If you had to depend on
them, you'd be up the creek. And they're
not the only ones. You know they'll get you
the parts when they want to. But we have
enough electronics people around here that
we're able to maintain our own stuff, most of
it.

Q: Do you have any other comments you'd like to
     make about pagination?

A: No, I love it. It's great, I don't have to
     go out and see that stuff's pasted on
     straight, it's there. My pet peeve is
     crooked type, crooked stuff. It just does
     not happen here. And it's clean, it doesn't
     have dirt on it.

Q: Great. Well thank you very much

8:   Robert Eringdon, Oklahoma Publishing Company

Q: What was the major consideration for im-
     plementing electronic pagination at your
     company, was it economics or technology?

A: Well, both, really, both of them. We
     selected that system and we have cut our
     composing room costs, probably somewhere in
     the area of fifty percent.

Q: Do you think you've had an increase in
     quality?

A: Yes, you know something that's rarely ever
     mentioned is crooked type, that's a thing of
     the past with a pagination system. It seems
     like most everybody talks about cutting
     costs, or this or that, but everything is
     straight when it's paginated also. The
     quality of the paper has really increased.
     We embraced pagination about the same time we
     left letterpress and went into offset print-
     ing. There was a remarkable change over-
     night. We were very pleased. We've been
     using pagination for probably four and a half
     years.

Q: So as a result of installing an electronic
     pagination system, has there been an increase
     in productivity?

A: Yes, there has.

Q: And how would you measure that?

A: I can't measure it exactly. We reduced the number of people in our composing room, our page count has increased. That's my measure right now. With half the people, we're doing a little more work than we were then.

Q: Has there been a savings in material costs?

A: Yes, I can't tell you exactly. From a composing room standpoint, we're not running as much paper.

Q: Has there been any increase in problems because of pagination?

A: No.

Q: Have electronic pagination systems helped editorial department in presenting later-breaking news?

A: Yes. Basically what pagination does for you is that you have the ability to hold pages longer for late-breaking news.

Q: Has it helped improve readership?

A: Well I don't know about that. It's a cleaner way, you don't have to paste in each individual item, so you get a cleaner and straighter looking product. In that way it could help readership.

Q: Okay. After installation of an electronic pagination system, has there been any change in your newspaper toward opening up some pages to advertisers who cannot afford a full press run, or to offer any other types of tailored information products?

A: I don't think pagination has affected that.

Q: Okay, do you do that at all?

A: Yes. We were doing it before and after pagination. I don't really think it's affected this as much.

Q: Do you have a system with the capacity for an
     integrated pagination process?

Q: Yes.

Q: Do you currently combine news text with ads
     and graphics?

A: Not to date, but we have. There's a couple
     of reasons for this. We've got a problem
     with one of the products out here, one of the
     vendors. But we do have the capability.

Q: Do you plan on going completely computer-to-
     plate?

A: I hope so, one of these days, whenever they
     get the technology together.
Q: Do you think that's the best way to go? Will
     it be practical and cost-effective?

A: Oh I definitely think it's the best way to
     go.

Q: Have there been further steps in technology
     for the newspaper industry, and to what
     extent will personal computers play a role in
     the production of a newspaper?

A: I think the pc is going to play a definite
     role in producing newspapers. The cost of the
     pc plus the standard off-the-shelf software,
     is going to allow us to be able to look at
     pcs.

Q: Have there been any other developments and
     research conducted in readership reaction to
     the quality of editorial and production of
     newspapers?

A: Not to my knowledge. There has been no
     survey, and I'm not too sure that the reader
     would know that there was anything different.
Q: Are vendors able to meet or to relate to the
     unique way that your newspapers operate?

A: Have they been able to relate, yes. Have
     they been able to meet our specs, no.

Q: Do you have anything else to add, or any
     other comments you would like to make about
     pagination?

A: The only thing that I can see at this point, is that I don't think the vendors are doing enough to date, to meet the newspapers' specs or needs.

Q: Do you think that the technology isn't available, or that they're just not working hard enough?

A: Well, they're saying that the technology's not available, but that's kind of hard for me to believe. I think the vendors are more order-driven than anything else.

Q: Well, thank you very much.

9:    D. Racey, Dominion Post Morgantown, WV

Q: To what extent are economics considerations, and or technology pushing newspapers into electronic pagination?

A: I think it's mostly economics, but technology is important too.

Q: For which of the following reasons did you install an electronic pagination system, economics, labor, or quality?

A: For all, we mainly got a reduction in composing room staff.

Q: As a result of installing an electronic pagination system, has there been an increase in productivity?

A: No.

Q: Have there been savings in material costs?

A: No.

Q: Has there been any increase in problems because of the new system?

Q: Now we have more stress on the editorial staff to produce the pages.

Q: Has electronic pagination helped the editorial department in presenting later-breaking news?

A: Yes.

Q: Has it helped improve readership?

A: No.

Q: After installation of an electronic
     pagination system, has there been any change
     in your newspaper toward opening up some
     pages to advertisers who cannot afford a full
     press run? Or to produce tailored
     information products?

A: No, we're too small for that.

Q: Do you have a system with the full capacity
     for an integrated pagination system.

A: No, nobody does.

Q: Is computer-to-plate the best, and will it
     meet the necessary criteria of being both
     practical and cost-effective?

A: Yes.

Q: Have there been further steps in technology
     recently for the newspaper industry? And to
     What extent will personal computers play a
     role in producing a newspaper?

A: Personal computers are going to continue to
     play an increasing role in newspaper
     production.

Q: Have there been any other developments and
     research conducted in readership reaction to
     the quality of editorial and production of
     newspapers?

A: No.

Q: Are vendors able to meet or to relate to the
     unique way that your newspapers operate?

A: Yes, for the most part.

Q: Thank you very much.