"The Development of the Video Display Terminal: A Two-Part Effort,"
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The video display terminal has been a staple in the American newsroom since the early 1970s. It follows a long line of printing methods, including Gutenberg's movable type, Mergenthaler's machine-oriented Linotype and adaptations of Senefelder's discovery of offset technology.[1]

However, the changes the VDT has brought to the newspaper business may be among the greatest ever introduced. By introducing the computer to the newsroom , the VDT permits greater speed in typesetting, more creative control, less time for corrections and typesetter instructions, more work by fewer persons, and a major cost savings.[2]

Perhaps lost in the taking for granted of computerized typesetting are two factors. One is the major impact this change had on the profitability of newspapers over the last 20 years. The second is that the development of the video display terminal, accomplished entirely in the state of Florida, was a result of two almost simultaneous quests: one newspaper company trying to reduce the cost of typographical errors, the other a space age industry seeking an application for a technology developed under government contract.

At a time when newspaper profits are among the lowest they have been in years, analysts looking back at the past 20 years point to the major impact of computerization.

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[1]"The Graphics of Communication," Baird, Turnbull and McDonald, Fifth Edition, Holt Rinehart and Winston, 1987, p.17
[2]Ibid, p. 18.

Newspaper economist John Morton, writing in the Washington Journalism Review, puts the economic impact of computerized typesetting into perspective. "Newspaper managers never scrimped on reinvesting in their own businesses when there was a clear payoff in sight. That's how the revolution in newspaper production technology came about. Buying photocomposition machines, computers, and electronic front end systems brought dramatic reductions in production employees. It had the added benefit of undermining union power, which is why only three or four newspapers are struck each year now compared with 25 or 30 in the early 1970s."[3]

Morton's point is that newspapers jumped into line to make investments when they could see an all-but-immediate payback, but they have been unwilling to make investments in long-range and less obvious improvements which would have helped their market share. These included "higher pay, bigger staffs, bigger news holes, and more and better market research and promotion. As a result they do not attract the best people, and readers turn to other publications for television and cable programming, community news, special interest coverage and so on."[4]

The economic impact of the VDT on the newsroom can be shown with some typical examples.

At a meeting of the Institute for Newspaper Controllers and Financial Officers in 1975, during the period of rapid introduction of

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[3]Newspapers are losing their grip," John Morton, Washington Journalism Review, May, 1987, p.52.
[4]Ibid.

electronic typesetting, it was reported the Los Angeles Times had cut its composing room force from 666 persons to 465 in one year.[5]

At the same meeting, Robert A. Eisenbraun of Gannett reported a drop in fulltime staffers from 10,196 to 9,496 -- 700 persons, almost all in production. (Author's emphasis) The company's original policy of guaranteeing jobs with the introduction of new technology has been modified by buyout arrangements, such as supplemental retirement payments limited to one year's wages. One Gannett paper paid $15,800 in severance to 12 persons and realized a savings of $1971 in weekly payroll, or $102,492 per year, Eisenbraun said.[6]

In the St. Petersburg Times' stereotyping department, the only unionized part of the paper, nine persons were retrained for the photo and engraving labs; three took severance; and three retired. In the composing room, 65 were moved to new jobs, nine retired, nine took severance pay and 105 were retrained.[7]

Editor and Publisher tracked the financial record of a daily newspaper with 34,000 circulation over four years during this period of introduction and reported composing room costs had dropped from $362,100 in 1973 to $272,052 in 1977, a drop of 26 per cent in four years.[8] Ads at that same paper during the same period were up 137 per cent, and net income up 184 per cent.[9]

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[5]"Bicentennial may spell recovery for newspapers," Editor and Publisher, October 25, 1975, p.14.

[6]Ibid.

[7]Ibid.

[8]"Production costs reduced fourth straight year, Editor and Publisher, April 29, 1978, p. 80.

[9]Ibid.

The benefits were slower in coming to the larger circulation papers because of unions and problems of scale. However, The New York Times invested $3.7 million in a new satellite printing plant in New Jersey and another $3.5 million into composing room equipment. "The full benefits of labor agreements permitting electronic composition and attritional reduction of the labor force are just ahead," a spokesman said.[10]

Despite significant reductions in readership, newspapers were able to maintain profit levels during the period 1970 to 1990 despite declining readership. As Morton pointed out (during this period) "an ever-growing percentage of the people in this country seem satisfied not to read a daily newspaper. Twenty-five years ago 111 papers were sold for every 100 households. The figure now is 68.

"Fifteen years ago, newspapers were delivered to 80 to 85 per cent of the homes in their immediate markets. Today the figure is 55 to 65 per cent, and less than 50 per cent in some areas."[11]

Therefore, it seems clear that introduction of the computerized typesetting systems had a major impact on newspaper profitability during the last 20 years. But when the systems were first envisioned, other factors were as important, if not more important, than the short-term profit picture of daily newspapers.

The development and testing of the video display terminal took place at two Florida newspapers, the Daytona Beach News Journal and Cocoa Today in Cocoa Beach. Daytona was a local, privately-owned newspaper attacking a production problem. Cocoa Today was

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[10]Expense to profit ratios changing," Editor and Publisher, June 12, 1976, p.31.
[11]Morton, op. cit.

a Gannett newspaper being used as a field test site by a space industry firm looking for applications for governmentally financed research.

Daytona Beach News Journal

Daytona Beach got into the effort in a desire to eliminate the cost of fixing typographical errors. The American Newspaper Publisher's Association, through its Research Institute, had shown that correcting typographical errors took 40 per cent of the typesetter's time.[12] Tippen Davidson, general manager of the News Journal, likened the corrections problem to "a car with a one-gallon gas tank. You spend more time walking around with a gas can than you do driving it."[13]

City editor John Gallant, who later became systems manager for the paper, said the News Journal was "state of the art" for the time, with a new building, offset presses and the relatively new, 'cold type" phototypesetting system (Type composed by exposing negatives of the characters on film or paper). "Corrections were such a problem we were coming out hours late. We often had to make corrections letter by letter with letters we took from pasted down proofs. Even the hot metal days were faster, when we could correct line by line," he said.[14]

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[12]Anthony Smith, "Goodbye Gutenberg: The Newspaper Revolution of the 1980s," New York: Oxford University Press, 1980, p. 93.
[13]Tippen Davidson, general manager, Daytona News Journal, in speech for 1973 symposium on "The Integrated Newspaper." Copy provided by newspaper.
[14]Conversation with John Gallant, Daytona Beach, March, 1985.

Davidson and Gallant went to a 1968 computer show in Atlanta and discussed the problem with consultant Ed Burg, who went to work on the problem.[15]

Hendrix CRT terminals were purchased in 1970 to make corrections on wire copy, "and there was an immediate improvement," Gallant said.

"Typed-in local copy was done on Swedish Facit typewriters wired directly into the computer system. It was in fact, two computers were used, one with a now-primitive 8K of memory for input and another with 16K for VDT memory and typesetting function.

"When copy was free of errors, it was then routed through another system to make paper tape to run the typesetters. The corrections problem in phototypesetting was avoided by making the corrections before the copy was sent to the typesetting system.[16]

The system was an improvement, but had obvious shortcomings. Paper tapes, and copy boys to run them, were still involved. If wrong numbers were applied to wire stories, the wrong stories showed up on the pasteup table. And only a very few stories could be processed at one time because of the limited amount of computer memory.[17]

The next stage involved three engineers introduced by Burg working around the clock with Gallant to develop an even better system. Steve Rotman, a management engineering graduate of

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[15]Ibid.

[16]Ibid.

[17]Ibid.

Rensselaer Polytechnic, Bob Bushkoff, an MIT graduate in electrical engineering and computers and Larry Liebson, an engineering management graduate of Northeastern University were involved.

The four developed a new system. The Hendrixes were replaced with Delta Data computers, an optical character reader (scanner) was added, with GRI minicomputers powering the system. The system they developed hyphenated and justified copy, formatted the computers, handled wire copy and provided for copyreading and proofreading.[18]

Computer publisher John Seybold put the date for the completion of the Xylogic Newspaper Production System as September, 1971. The Daytona Beach paper did not keep records as to times or dates.[19]

While copy editing on the computer screen took "80 percent longer than copy editing on paper," the time was made up in making corrections. For this reason, at this stage, the thought of reporters writing stories directly into the system was seen as too expensive. "We don't see any gain in using a CRT (cathode ray tube, similar to VDT, video display terminal) as an initial input device, either in the hands of news writers or key punchers. Except in special circumstances, it is too expensive."[20]

After a year with the system, Davidson said, errors were reduced from one in 27 lines to one in 300 lines; production time was

[18]"Daytona Beach newspaper saves with system approach," Editor and Publisher, April 14, 1973, p. 42-44.

[19]Seybold Report, Vol. 1, No. 21, June 12, 1972. Copyright Graphic Communications Computer Association of the Printing Industry of America.

[20]Davidson speech to the Integrated Newspaper seminar, op. cit.

cut by one-third and type could be set in three minutes, if necessary. Composing costs were cut by $60,000, and the unions were satisfied because all persons whose jobs were eliminated were given other jobs during a period of rapid expansion at the newspaper.[21]

When the project was completed, the Daytona paper decided it did not want to be in the business of selling the systems it had developed. The engineers decided to go into the business, and formed Xylogics Corporation, with a royalty arrangement to the News Journal for funding the testing phase.

In 1972, Xylogics signed a marketing agreement with Datascan Corporation. A year later, Datascan was purchased by the Dymo Corporation. In 1976, Dymo bought the Xylogics systems business.[22]

Cocoa Today

During roughly the same time period, a much larger and more complex testing was going on at Cocoa Beach, Fla.

While the Dayton Beach project had started sooner (1968 as opposed to 1969 in Cocoa), the Cocoa project which announced "an electronic system for editing and proofreading stories on a video display terminal before they are set in type" was announced May 12, 1970, about 15 months prior to the date Seybold gives for the completion of the Xylogics test phase.

However, Daytona Beach had been using working models of the system prior to that date, so determining who was first becomes largely a matter of definitions.

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[21]Ibid.

[22]Edith Myers., 'Florida to Sweden," Datamation Magazine, January, 1979, p. 73.

<u>presstime</u> magazine of the American Newspaper Publishers' Association said "Although a small argument surrounds the location and date of the first editorial front-end system, many vendors and newspaper people feel it was at the Dayton Beach Journal about 1970."[23]

Harris-Intertype of Melbourne, Fla., later known as the Harris Corporation, bought a firm called Radiation, Inc., in 1967. Harris had started in Cleveland, O., and had been a major printing press and typesetting equipment manufacturer since 1890.

Radiation, Inc., was a sophisticated manufacturer of space communications hardware, and employed nearly 1,000 specialized electronics scientists and engineers.[24]

One of the projects Radiation, Inc. had developed was a computerized message control system for the military. Messages sent from Washington to overseas commands had been handled by punched paper tape, which presented problems when updates were sent or when handling of large numbers of paper tapes became unwieldy. Radiation developed an electronic system for handling messages and updates, a system similar in many ways to the present day video display terminal.[25]

When Radiation was merged into Harris, meetings were held to determine how to apply the technology Radiation had developed to Harris's field of specialization, the printing business. Walter Frederickson of Radiation spent a year on the road in the United

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[23]"VDT, now an old friend, has a short history," <u>presstime</u>, Aug., 1983, p. 32.
[24]1985 letter from Fred Baker, then director of public relations for Harris.
[25]Conversation with Walter Frederickson, Harris Corp., Melbourne, Fla., March, 1985.

States studying applications, making a major recommendation that the newspaper industry become a target for technology similar to that developed for the military. Since the newspaper industry was using paper tape, the comparisons were logical.[26]

Paul McGarrell, in charge of product development at Harris, said:

"Frederickson had never been inside a newspaper before, but he was invaluable. We got guys like those at Gannett, which had a paper at Cocoa 20 miles away, to say, 'If you guys are serious, you can live at this newspaper.' "[27] Ironically, Cocoa is only about 60 miles south of Daytona Beach.

The team from Harris studied all areas of newspaper production from classified ads to editing and proofreading. They focused first on eliminating the typographical error correction cycle. More than 90 per cent of the original errors, as well as the job of proofreader, were eliminated with the"video typewriter."[28]

Jim Rife, later to work in establishing color printing plants across the United States for USA Today, was in production at Cocoa Today at the time. "We taught Harris the newspaper business and they taught us the new electronics," he said.

Rife recalls Cocoa Today was "a typical morning newspaper," with "tons of paper tape." It was more oriented to news than advertising, due to its relatively young age. It was the only paper in

[26]Ibid.
[27]"A Double-Barrelled Overhaul for Harris Corp.," Business Week, Oct. 26, 1974.
[28]Ibid.

the country in 1970 that had started from scratch after World War II and not folded.[29]

The early experimental months were not easy. System crashes were so common that "every 20 minutes the system would die (crash); you could set your watch by it. An editor would set his copy and dump it out on tape so he wouldn't lose it," Rife said.

The testing period became "pretty close to a 24-hour job just to keep the system functioning," he said. One of the first demonstrations, for wire services and large newspapers, was a 9 a.m. program, for which many of the staff "stayed up all night to keep the system running. Everything went great."

Storage very quickly became another problem. "We thought what we had would be more than we would ever need, but when editors started saving copy, we found it was nowhere close. When we added the wire service, we ran out of storage in 24 hours."[30]

The cooperation of employees who knew they were in on the ground floor of a revolution in printing was excellent, Rife said." The newsroom was excited because it knew it could get more control over the copy. The composing room was just as excited, amazed at what could be done with the computer. You could set type that was already corrected and ready for paste-up and not worry about it."[31]

It soon became evident that the rest of the industry was also excited about the test. Once word got out, "every day there was a

[29]Letter from James Rife to author, May, 1983.
[30]Ibid.
[31]Ibid.

new group of people coming in from Sweden, Germany, Japan and all over the United States."[32]

The Harris-Gannett development was announced in a May 12, 1970 press conference headed by Al Neuharth, who had been elected president of Gannet the day before.

Field testing of the terminals was completed by October of 1970, and by May of the following year there were 30 newspapers and commercial printers in the United States using what had been entitled Harris 1100 systems.

Frederickson and others in his group obtained patents on several of the inventions involved in the development. Included were patents for the editing apparatus, for the now-popular wrap-around feature in the editing and correcting terminal, and another for the scrolling capabilities, the ability to bring additional copy to the screen.

Many of these features are now accepted on word processing and editing systems, and were developed as a response to a need for correcting the all-too-familiar typo in the newspaper story. And as a direct by-product of the elimination of unnecessary steps, the terminals have led to the elimination of unnecessary jobs, and directly to the survival and prosperity of newspapers during the past 20 years.

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[32]Ibid