

Additional references and notes for Interleaf, Inc.—1981 to 2000

In the following, the letter at the beginning of a note is a letter shown in the main text as a superscript; words or a topic from that page of the printed text then appear indicating the specific words near the superscript letter to which the note or reference relates; then comes the note or reference itself.

a Boucher and George then broadly investigated electronic publishing

Boucher and George were undoubtedly already somewhat familiar with electronic publishing possibilities. In addition to making a reading machine for the blind, their employer Kurzweil Computer Products (KCP) was in the document creation business, using optical character recognition to create documents and send them to word processors. KCP also had an inhouse Xerox Star workstation.

b Boucher and George then broadly investigated electronic publishing

Matthias Blumenfeld, in Interleaf: die Integration von Text und Grafik, *Informationstechnik* it, 28. Jahrgang, Heft 6/1986, says the founders “interviewed 25 companies during a six-month study phase.”

c Etude was aimed

Also relevant are: Richard Ilson and Michael Good, Etude: An Interactive Editor and Formatter, M.I.T. Laboratory for Computer Science. Office Automation Group Memo OAM-029, March 1981; Michael Hammer et al., The Implementation of Etude, An Integrated and Interactive Document Production System, *Proceedings of the SIGPLAN SIGOA Symposium on Text Manipulation* (Portland, Oregon, June 8–10, 1981), *SIGPLAN Notices*, 16 (6), June 1981, pp. 137–146, tinyurl.com/implement-etude; and Michael Good, Etude and the Folklore of User Interface Design, *Proceedings of the SIGPLAN SIGOA Symposium on Text Manipulation* (Portland, Oregon, June 8–10, 1981), *SIGPLAN Notices*, 16 (6), June 1981, pp. 34–43, tinyurl.com/etude-folklore

d NuMachine

en.wikipedia.org/wiki/NuMachine

e based on Ecrit

Ecrit remained the internal name for the basic editing function of the Interleaf system although over time it evolved from the original implementation.

f plus business charting

The charting had been implemented by Crawford and Morris.

g sold computer-based publishing systems

The Seybold report judges that the Interleaf system was not actually suitable as a graphic arts system—it could not do refined enough work for that industry.

h biggest winner

Another example testimonial, from Michael Mark who eventually moved to Interleaf to manage System Integration: “I was at Cadmus Computer, we talked Interleaf into putting their software on our machine and our customers went wild for this software, they loved this software. They didn’t care if it was running on our machine or some other machine but they couldn’t get the software on other machines so we sold a lot of equipment just because of the software.” tinyurl.com/michael-mark

i workstations of other companies

According to Interleaf co-founder Harry George, “Compugraphic offered \$1M for the right to sell the Interleaf software. Interleaf’s engineers doubted that Compugraphic could deal with such complex software, which ultimately turned out to be true. Thus, in effect, Compugraphic paid Interleaf \$1M to fail to become a competitor of Interleaf.”

j Interleaf beat them out

Harry George also noted that the price of printers and computers came down faster than expected. “The trend was clear but the [venture capital firms] took a while to understand it.”

k For more details

Harry George on the financial history of Interleaf as he knew it, email of 2019-12-10 with slight corrections over the next two days by phone and email.

[Before the IPO]

Starting out took us longer than we thought it would to get our funding. We thought that after the successful exit of Kurzweil to Xerox we would have an easier time. We formed Interleaf in May of 1981 and did not close on any money (other than ours which wasn’t much—mostly \$10K each from David and me)—until we finally raised money from MTDC (Massachusetts Technology Development Corporation). They invested \$150,000 in equity and committed to a \$50,000 loan (at what seems surprising now—a 15.5 percent annual interest rate) paid monthly from the start. They made a very good deal and got 25 percent of the Company giving the company at the first raise (if you don’t count the debt portion) a post-money valuation of \$600K. There was in the deal the possibility of a second loan of \$100K but we never took that. The price of the equity was \$4.50 per share. This was the Series A Convertible Preferred round. In an email of 2019-12-11, Harry George added, “Even before they had sold their whole position, at one point on sales sold, MTDC has made over 40x on their investment. At the time that was their best return.”

Next we raised an angel round from about 35 individual investors totaling just over \$500K. We closed the last tranche of that in April 1983. The shares were priced at \$11.25. This resulted in a post-money valuation of just about \$2M. This was the Series B Convertible Preferred round.

Next we raised Series C Preferred which was our first venture round. This round totaled \$2M. The three VC funds were Hambrecht & Quist, First Chicago (Canning’s group that later became Madison Dearborn) and Applied Technology Partners. During the year there was a 10-for-1 split of all the shares (common and preferred), and the

price per share for C (after giving effect to a split for C in the form of a dividend) was \$2.25. This was transacted in November of 1983. After Series C the post-money for Interleaf was \$6.5M.

The Series D round was done in October of 1984. Prior to Series D the Company effected a 2-for-1 stock split for Common and Preferred. The above three venture firms all invested but the round was led by Kodak who came in for \$3M of this \$5M round. Bank Boston took a small piece as did the partnership fund of Alex Brown. There were a few other small funds included. Shares outstanding now were 6,931,321 so the post-money or market cap of Interleaf after this round was about \$38.4M. The Series D shares were priced at \$5.54 after the split.

In our last round as a private company we raised \$7.5M (Series E Preferred Convertible Stock). This was a mezzanine round done at a 10 percent step-up at \$6 per share looking forward to an IPO at \$12 to \$18 per share and included all the previous investors plus a number of others, most notably Horsley Keogh, Hillman and T. Rowe Price. After the E round the post-money valuation of Interleaf was \$50.6M.

[the IPO, etc.]

In June of 1986 we did the IPO and sold 3,000,000 shares at \$10 per share. Kodak was among the selling shareholders. The deal was led by Alex Brown with Lazard Freres & Co. in the middle and Hambrecht & Quist on the right.

The day of the IPO Xerox protested the 600S publishing contract which Interleaf, acting as a supplier of publishing systems to EDS for wide deployment in the US Army, had won. This, we believed was the largest publishing contract in history. EDS was the prime. Xerox had a close relationship with Jack Brooks, a US Congressman from Texas. Xerox, through Jack, protested that EDS had cheated on the BAFO (Best and Final Offer) and changed their price unfairly late with inside information. Three agencies were involved in the contract: The US Army, the GSA (Jack Brooks was connected here) and the Government Printing Service. This was not true and years later we got a substantial break-up fee. By then desktop publishing had moved on and the contract was never let.

The timing of the announcement, the morning our IPO went live, derailed the IPO. For only the third time (I think this is still true) in NASDAQ history a company went public and private in the same day. We had gone out, if I remember at \$12 per share and traded up to \$14. We were in the LA airport (before cell phones) when we found out. Dave Boucher was asked over the loudspeaker to come to the white courtesy phone. We had had our breakfast meeting with investors in LA and were on our way to SF for a post-IPO lunch with investors there. Instead we went to the SF office of Alex Brown and had something like a 40-person conference call. The decision was to unwind the whole IPO.

Unwinding an IPO and going private immediately after going public literally on the same day had only happened twice before. Once was Eagle Computer and one was Celestial Seasonings. The CEO of Eagle Computer, no doubt excited by his IPO, had bought a new Porsche and, in his enthusiasm, drove off a cliff and died the same day as the IPO. In the case of Celestial Seasonings, the FDA had received a complaint that they had worms in their tea and Food and Drug overreacted. In both of these two cases the IPO at that time was never done. Not sure what happened later to Eagle Computer but Celestial Seasonings was bought by Lipton as a private company. Many years later they may have spun out and gone public.

But Interleaf regrouped. We had downplayed the importance of the 600S contract in the S-1 contract because we were not sure how big it could be. So we were able to resticker the S-1 and go out just one week later. On our second IPO we went out at \$10 per share but traded back up to \$14 again. Closing, if memory serves, at the same price as before. We were the only company of the three that went public and private in the same day that managed to get out again. It was a real rollercoaster ride for that week. At the close of the day of that second IPO the value of Interleaf, now with 7,200,708 shares of common stock now outstanding, was slightly over \$100M with the stock at \$14 per share.

In terms of completing the financing history of Interleaf, just before I left in 1989, we did a \$15M pipe (Private Investment in a Public Entity) with Advent. (Clint Harris joined the Interleaf board.)

Altogether we raised about \$60M. We were bought in 2000 by BroadVision for about \$900M.

l it was release 2.0

There was no Release 1.0—only the working demonstration system. According to Harry George, the demonstration (done at Boston's Le Méridien hotel) was done before Interleaf hired a group of programmers from a word processing company in Colorado, thus making it clear that Interleaf was not using code from the Colorado company.

m for its time

See also the tutorial document(s) under "Materials copied from bitsavers" at tinyurl.com/interleaf-ops2000

n ran on a Sun workstation

Steve Pelletier, 11/30 email: "One interesting quote about early Interleaf is that Sun Microsystems credited Interleaf with driving 11 percent of their workstation sales in its first few years. I heard that directly from either Eric Schmidt or Bill Joy."

Harry George, in emails and phone calls of December 11 and 12, 2019, said that the percentage was more like 30 percent and that in either case the Sun people understood that Interleaf sales helped Sun get started.

o are sketched in the Webnotes

About releases 2.5 to 4.

The next big release, in 1986, had a name change. OPS had to do with Interleaf's initial idea that it was an Office Publishing System—able to prepare a document with text and graphics more cheaply than with traditional manual methods. The 1986 release was named TPS 2.5, for Technical Publishing System. Interleaf's system was not just for the office; it was for any kind of technical publishing including driving a typesetter. *The Seybold Report on Publishing Systems* reviewed TPS 2.5^a (and also commented on the upcoming TPS 3).

TPS Release 2.5 included multi-column editing of text flowing from page to page (not having this was a major deficiency of the original system), automatic hyphenation and justification of text, an electronic clip art library, and an interface to support importing CAD (computer aided design) drawing into an Interleaf document. The system ran on Sun, Apollo, DEC, and IBM workstations, which could be mixed together and communicate with each other and with file servers on an Ethernet. The Sun configuration was a 68020-based Sun/3 with 4MB of memory, a 19-inch display, 86MB disk, and optional Canon CX 300 dpi laser printer; the price was \$29,900.^{b,c}

TPS Release 2.75 supported international sales—including handling fonts, menus, hyphenation dictionaries, and documentation for other languages.

TPS Release 3a (in late 1986 or early 1987) included keeping track of sections, illustrations, etc., and renumbering as things moved; indexes and tables of contents; image editing and capability of painting on scanned images; equation editing; and more fonts.^d

TPS Release 4 (maybe June 1988)^{e,f} included tabular formatting that could grow dynamically and span multiple pages; a Lisp-based desktop command language for user customization; a document management capability; ways to optionally print different versions of a document; more input and output options; and the system was now sold in modules among which customers could choose.

a. Bill Solimeno and Jonathan Seybold, Interleaf: A Fast-Moving Tech-Doc Supplier, *The Seybold Report on Publishing Systems*, vol. 15, no. 22, July 1986, pp. 3–21, history.computer.org/annals/dtp/interleaf/seybold-publishing-systems-volume15-number22-1986-07.pdf

b. Frederick Egan on Interleaf, perhaps at a meeting of people from Business Land, 1986, [youtube.com/watch?v=ctpZ2a6vrxE](https://www.youtube.com/watch?v=ctpZ2a6vrxE)

c. *Interleaf Publishing System, Training Manual, SUN/Release 2.5*, history.computer.org/annals/dtp/interleaf/1983-Interleaf_2.5_Sun_Training_May86.pdf

d. *Interleaf Technical Publishing Software, Reference Manual, Sun/Release 3.0*, volumes 1 and 2, history.computer.org/annals/dtp/interleaf/1986-Interleaf_3.0_Sun_Reference_Vol_1_Dec86.pdf, history.computer.org/annals/dtp/interleaf/1986-Interleaf_3.0_Sun_Reference_Vol_2_Dec86.pdf

e. Interleaf, *The Seybold Report on Publishing Systems*, vol. 12, no. 15, April 1988, pp. 12–14, history.computer.org/annals/dtp/interleaf/1988-15-seybold.pdf

f. history.computer.org/annals/dtp/interleaf/1989-interleaf-sales-brochure.pdf

p A “book”

See chapter 16 at history.computer.org/annals/dtp/interleaf/1986-Interleaf_3.0_Sun_Reference_Vol_1_Dec86.pdf

q boxes under Marketing

Harry George has noted (ibid) that while Wang didn’t catch on to the opportunity Interleaf saw and never switched over from the word processing business, Interleaf was able to recruit lots of good sales people from Wang. Recruited from Wang, George Potter was Interleaf’s eighth employee and Fred Egan was the 24th. Both had been highly placed in the Wang organization and knew lots of other Wang people that might be recruited.

Harry George has also described [the following quote is slightly paraphrased] “how Interleaf got to all the foreign markets so fast. Interleaf had to expand internationally as they were selling to multi-national companies and competing against Xerox. Interleaf sold the right to sell the Interleaf product to a venture firm in different territories, typically countries. The firm had knowledge of the territory and people that Interleaf did not have. The firm had the responsibility of putting together the management and sales staff. A firm which bought such rights paid Interleaf a one-time fee for the right which Interleaf could book as revenue because the deal did not require Interleaf to guarantee a buy back. Interleaf did this in multiple countries, starting with Canada, then France, etc. The UK and perhaps Japan were places where Interleaf set up its own operation. There was a revenue split on products sold.”

r headquarters

Speaking of headquarters, the original location was in David Boucher’s basement. As the company grew, it moved to a succession of locations, first in Cambridge and then in Waltham: The first four Cambridge locations were 126 Inman Street, 955 Massachusetts Ave., and 1100 Massachusetts Ave. (including necessary extra space in “The Garage” at 36 JFK Street in the heart of Harvard Square). In about 1985 the company moved to a 110,000 sq. ft. facility at 10 Canal Park in East Cambridge and then added space in the nearby Davenport building. Sometime in fiscal year 1991 (April 1, 1990, to March 31, 1991) the company headquarters moved again—to a big building beside Route 128 at 9 Hillside Ave. in Waltham, MA, with a big “Interleaf” sign on the side of the building. The company’s final location was a smaller office at 62 Fourth Street in Waltham.

s marketing organization

Another important part of the marketing effort was public relations. Harry George recruited Steve Schwartz to Interleaf; Schwartz was an outstanding PR person (who sometime after Interleaf founded Schwartz Communications, one of the most successful high tech PR firms in the U.S.). According to George, Interleaf needed a strong PR capability to somewhat level the playing field of selling to large companies in competition with Xerox. PR is cheaper than advertising, and publicizing a sale to one big company could increase Interleaf credibility in selling to the next big company. Interleaf was unusual for time in having its own strong in-house PR capability. Schwartz says (2020-01-11 email), “Interleaf was one of the first tech companies . . . to employ consumer marketing techniques, which resulted in a stupendous amount of media coverage for the company, which resulted in an extraordinarily high public profile for a young company, with all the attendant benefits.”

t elite group of programmers

Interleaf had a Fellows program which recognized key contributors, who were recognized in the annual reports in parallel with company officers; see history.computer.org/annals/dtp/interleaf/1987-Interleaf-first-Fellows-announcement.pdf. They mostly came from the product development group.

u smart defaulting and stickiness

“Power users” loved the smart defaulting and stickiness features because they made them more productive. Novice users, especially those from the later developed Windows or Mac environments, tended to hate them because they were different from what they expected and required changes to established habits.

v Several clever techniques

Several clever techniques were used to make the Interleaf system be very fast for users.

1. Virtual memory was a new feature in commercial products, and Interleaf engineers took advantage of it and designed around its quirks. Rather than using the standard system memory allocation (malloc) function, they

developed a package called “Units” which served to minimize time-consuming page faults by grouping together related memory items into the same page.

2. Interleaf adopted the incremental formatting and incremental display ideas that were pioneered by Etude, and extended the idea to pagination. For example, if the user made an edit to a line of text, in many cases only that line had to be reformatted, and maybe only one following line. When text lines or graphic objects needed to move on the screen, in many cases cached bitmaps could be used so that the item did not need to be redisplayed from scratch.

3. To greatly speed up certain graphics operations, a sort of compiler was implemented in C which generated an array of machine code and then executed it repeatedly with different parameters. The code could, for example, take a single line of a raster image and rotate it a certain amount. The code would contain no loops or loop book-keeping, and might contain pre-computed constants that would be inefficiently repeatedly recomputed if the code was in a tight loop. This is sometimes called “straightening” or “unwinding the loops”. When this code was first shown to engineers from Sun Microsystems in an early demo, it was so fast that they thought that the demo was faked.

w Lisp

Paul English (2020-01-12 email) emphasizes that Thomas Polucci developed “the core Lisp engine (the interpreter and debugging tools)” that was tightly integrated with the TPS/Interleaf releases.

x structured and active documents

Paul English noted (2020-01-12 email) the following innovation: “we invented the ability for a document to contain code right inside the document. This is important for two reasons. First, it meant that when you opened the document, it could dynamically change its user interface or contents based on its environment. Second, it meant that I could email you a document, and the code would be shipped with it”.

“Another general point I would make about Interleaf is that we were, at the core, building highly structured documents, almost like a database for each document. This structure allowed us to do things like instantly change numbering in lists inside tables across hundreds of pages.” (Structured documents had been part of the Interleaf system from the beginning; the system had always been a structured document editor.)

y programmable at every level

Interleaf 5 was so programmable that other editors could be built on top of it, for instance as described in: Robert A. Morris, Edward M. Blachman, and Charles Meyer, A constraint-based editor for linguistic scholars, *Electronic Publishing*, vol. 6(4), pp. 349–360 (December 1993), cajun.cs.nott.ac.uk/compsci/epo/papers/volume6/issue4/ep6x4ram.pdf

z little standardization

Juliusz Chroboczek, Choosing a scalable font format, www.irif.fr/~jch/software/font-formats.html

aa little standardization

Adobe Type 1 fonts were released along with PostScript in 1984 and originally were not publicly documented and only worked with Adobe products. In 1990 Adobe Type Manager (ATM) was created to compete with Apple and Microsoft’s announcement of TrueType fonts; ATM allowed Type 1 fonts to work on Apple Macs and Microsoft Windows systems; Adobe also published the Type 1 font format. TrueType didn’t run on Macs until 1991 and on Windows until 1992. OpenType came into full being in 1996 to supersede Apple’s TrueType and Adobe’s Type 1 fonts.

ab more pixel width than was usual

Kathy (Nitchie) Zola, communication of November 1, 2019:

“If you look at the line length of sample text set in various point sizes of the same type face, you would expect them to maintain a proportional length relationship to each other. That is, the 6 point sample line length would be roughly 50 percent of the 12 point sample line length, 25 percent of the 24 point sample line length, etc. This is reasonably easy to maintain at 300 dpi. The challenge comes when you need to also maintain a 75-dpi version that proportionally matches the character widths (4:1 ratio) of the 300 dpi type face.

“Consider the letter O. To make a legible version at 75 dpi, you need 4 pixels across: 1 black pixel for the left stroke of the O, 1 white pixel for the center of the O, 1 black pixel for the right stroke of the O, and 1 white pixel for spacing so that it does not crash into the next character. When you scale up to 300 dpi, that 4 pixels becomes a minimum 16 pixels that would be needed to match the 2 resolutions.

“However, if the master high-resolution typeface being used to generate these bitmap fonts produces an O that is 12 pixels wide at 300 dpi, you would need to make a 3-pixel wide version at 75 dpi. That would not meet our 4 pixel minimum legibility requirement. So we widened, or expanded, the character widths for both the 75dpi and 300dpi versions for point sizes (usually 6 and occasionally 8 point) where we ran into that problem.”

ac In the long run

The eventual inclusion of Unicode was eased by the fact that from the beginning the Interleaf system had 14-bit characters, as characters were one of several token types the system stored in 16-bit words.

ad investor Kodak was able to sell

Harry George email and phone calls of 2019-12-10 and the following two days.

Kodak realized that their film business would be going away as the world became digital, and they wanted to jump into the document business. It invested in both Interleaf and Sun thinking that these two companies had the document software and hardware and Kodak had the sales force. Bob Murray, treasurer of Kodak, joined both boards. . . . This business didn’t work out so well for Kodak; and, less than a week before the Interleaf IPO, Kodak decided to sell its investment in this business. That meant that less of the money taken in with the IPO went to Interleaf.

ae SEC registration

According to Harry George, “the S1 [registration statement] for the IPO was composed in house—not through a financial printing company such as Bowne. This was an early, perhaps first, instance of this being done.”

af **IBM Publisher**

Harry George believes that “IBM Interleaf Publisher was the only time IBM did such a joint company product name. This was for IBM’s RISC machine, and IBM was very sensitive about Interleaf having such a machine. It had to be in a secure alarmed room and chained to the floor. IBM paid Interleaf \$5M for the right to sell the system on its RISC machine.”

ag **curves of Figure 1**

Notice that in 1992 Interleaf had over \$100M in revenue—a notable accomplishment for the early days of companies based on software sales.

ah **SGML**

Steve Pelletier, email of 2019-11-30: Interleaf’s achievement as an SGML-derived real-time formatting engine could have evolved into an HTML composer, i.e., browser. I left Interleaf for Intuit in the fall of 1991, and I couldn’t believe that Interleaf squandered the browser opportunity.

ai **More details**

1990 to 1997

After the corporate restructuring of 1990, in 1991 things were getting better; although revenue was flat, the loss was down from \$16 million to a little over \$1 million. An important step forward was the release of Interleaf 5 (effectively TPS 5 but with a new name) late in calendar 1990. *The Seybold Report on Publishing Systems* gave a very nice review and long analysis of this new system under the title “Interleaf 5: A Complete Overhaul of TPS.”^{a,b} The company also released other products that complemented Interleaf 5—the Viewstation, Mainframe View and Print, and the Relational Document Manager systems. RDM was sort of a version control system for document writers and was part of a push to be a dominant company in the document management market in parallel with its traditional publishing system business. The company also held its first worldwide (twice a year) users conference (ICON) with 500 customers attending.

There was nice revenue growth and good profit in 1992 and 1993. The company expanded internationally, including establishing a Japanese subsidiary and pushing Interleaf 5 in Japan where it was highly regarded.^c The company also launched WorldView (a system like Adobe Reader). WorldView Press was another component that converted documents in various different formats into the format WorldView could display. Handling SGML was also becoming important.

Around 1992–1993 Interleaf put significant resources behind a 32-bit version of the software for Microsoft Windows, and was seriously impacted when Microsoft failed to deliver usable 32-bit support, and they had to use third-party memory-extender hardware instead. The belief at Interleaf was that Microsoft deliberately went slow in releasing a 32-bit version of Windows in order to give Excel and Word time to expand their market share without competition from better technologies that required more memory. (How could it take from 1988 to 1995 for Microsoft to go from 16 bits to 32 bits?) Microsoft had become the business “standard” by the time 32-bit Windows was available. Without the ability to compete with Word in a 16-bit environment, Interleaf was forced to compete for higher and higher end applications; Interleaf applications became more and more specific while Microsoft took over the general market.

In 1994 revenue shrunk a little, and the loss was attributed to being a one-time charge for acquisition of Avalanche Development Company and for some company restructuring. The company also announced Intellecte as part of its integrated document management business. Interleaf 6^d was also released with emphasis on Windows and Windows NT, completing the company’s “Windows strategy” across all their products” and further supporting distributed publishing processes in a networked environment. Despite Interleaf’s desire and efforts to compete in the personal computer world, it continued marketing to and developing products for companies with the largest and most comprehensive document processes.

PC Magazine in May of 1994 reviewed the nine desktop publishing systems listed in the following image (all in their Windows version) [*PC Magazine*, May 17, 1994, pp. 164–206, tinyurl.com/interleaf-pc-mag]

	Greeting cards	One-page fliers	Newsletters or brochures	Reports	Technical manuals	Four-color output	Magazine design
PROFESSIONAL-LEVEL PACKAGES							
Corel Ventura for Windows	Intended	Intended	Intended	Intended	Intended	Intended	Intended
FrameMaker for Windows	Intended	Intended	Intended	Intended	Intended	Intended	Intended
PageMaker for Windows	Intended	Intended	Intended	Intended	Intended	Intended	Intended
QuarkXPress for Windows	Intended	Intended	Intended	Intended	Intended	Intended	Intended
ENTRY-LEVEL PACKAGES							
CompuWorks Publisher for Windows	Intended	Intended	Intended	Intended	Intended	Intended	Intended
Microsoft Publisher	Intended	Intended	Intended	Intended	Intended	Intended	Intended
PagePlus for Windows	Intended	Intended	Intended	Intended	Intended	Intended	Intended
PFS: Publisher	Intended	Intended	Intended	Intended	Intended	Intended	Intended
Publish It! for Windows	Intended	Intended	Intended	Intended	Intended	Intended	Intended

Nine non-Interleaf desktop publishing systems

One reason Interleaf wasn’t mentioned is that Interleaf 6 was yet available under Windows (but was running on workstations and minicomputers). More relevant perhaps was the sidebar on pages 184–5 by Don Labriola entitled . . . “And Then There’s Interleaf.” The sidebar notes that Interleaf had more than 250,000 installations and is the system that can handle applications with documents that have “hundreds of thousands of pages and involve dozens of authors, artists, and incompatible computer systems scattered around the world.” The sidebar concludes, “If you are faced with generating massive, highly volatile documents in a heterogeneous workgroup environment, there is nothing else quite like Interleaf 6.” In other words, Interleaf’s strength was not in what the magazine considered the mainstream of desktop publishing.

The 1995 \$48 million loss on decreased revenue was attributed to “underlying operations issues”, and a cost cutting effort ensued including a headcount reduction to 674 (from the 800s) and closing a dozen-and-a-half field offices. Employee morale was low. Reacting to the increasing importance of HTML for document viewing, Cyberleaf was released; it was like WorldView Press but for HTML rather than WorldView’s format.

Interleaf had essentially the same revenue and slight profit in 1996, there had been a slight reduction in headcount (to 647), and the company was pushing hard for additional growth. The company was working on major enhancements to its products running on more platforms and important new products. It was also increasingly moving from selling authoring and publishing tools to providing integrated document management solutions (“solutions” required a different kind of selling as the sales cycle could be as long as a year). Interleaf also did a deal resulting in the Intellecte/BusinessWEB product, and acquired The Learning Alliance for another sophisticated offering, Intellecte/SalesTeam.

However, in 1997 there was a \$29 million loss on a 28 percent decrease in revenue. The president resigned in the eighth month of the fiscal year, and Jamie Ellertson became president in January 1997. As part of the president-resignation press release, Interleaf said it closed six branch offices and let 20 percent of employees go (which would have reduced the employee count to 517). By the end of the fiscal year (March 31), with Ellertson as president, the employee count was down to 342.

a. Mark Walter, Interleaf 5: A Complete Overhaul of TPS, *The Seybold Report on Publishing Systems*, vol. 20 no 5, October 8, 1990, pp. 3–20.

b. Dymalski and Weinberger books under bitsavers at history.computer.org/annals/dtp/interleaf/

c. Interleaf press release, January 20, 1993, history.computer.org/annals/dtp/interleaf/1993-Interleaf-Japan-product-of-year-Japan.pdf

d. www.faqs.org/faqs/interleaf-faq

aj focus on complex publishing

The company also brought out BladeRunner,^a an “enterprise content management system”, layered on Interleaf 6 and integrating a visual DTD editor from Microstar^b and FastTag (acquired with Avalanche) “that could import a styled document from a word processor format, such as RTF, and create a well-formed XML document.”

a. Interleaf press release, February 5, 1998, xml.coverpages.org/interleafMicrostar.html

b. Liora Alschuler, Interleaf prepares BladeRunner, *The Seybold Report on Internet Publishing*, vol. 2, no. 9, May 5, 1998, xml.com/pub/a/SeyboldReport/ip020905.html

ak many different system configurations

The chart at history.computer.org/annals/dtp/interleaf/product-chart.pdf (from about 1996) indicates handling 4 or 5 different operating systems and other major pieces of software (Unix, DOS, Windows NT/95, Motif), on a dozen different platforms, running multiple product releases on multiple platform releases, supporting up to 7 different languages, with approaching 20 separately priced options. This is not including whatever special customization was done as part of integration into the customer’s operation and various other software packages a customer might have bought from Interleaf.

al Only Quark

Adobe’s reimplemention of PageMaker, sold as InDesign, in time became more successful than QuarkXpress.

am Y-Combinator

ycombinator.com