The Word Processor Wars, 1978 to 1996: Reflections of a Participant Observer

John V. Lombardi, *The Club*, January 5, 2012
Springfield, Massachusetts

For a little over a decade, the microcomputer revolution spawned an intense competition among small machines and their corresponding software. Apple, Exidy, Radio Shack, Atari, IBM PC, Compaq, Osborne, and many other brands of hardware competed to capture the wave of interest in small machines. Although today most microcomputers are either Microsoft-PC clones of one kind or another or Apple proprietary machines, the late 1970s to the early 1990s witnessed a proliferation of products and software. What has become the virtually ubiquitous personal computer (and its derivatives in smart phones and tablets), began as a hobbyist enthusiasm. The move to the mainstream of American business, academic, and consumer users required the development of software that would turn these clever little machines into useful tools for ordinary work. The process of developing useful software proved complex, challenging, and fascinating. Computer makers and software designers worked in concert and in competition to find the right combination of hardware power and software features that would produce inescapable utility at consumer price levels. Most of the time we see the face of the software, hence the focus on a "killer app," but the development of killer applications in the early years depended as much on the capability of the hardware as on the imagination and creativity of the software designers and programmers.

Among the killer applications that transformed the microcomputer industry, two stood out: word processing and spreadsheets. The individual user-accessible spreadsheet program, made itself a key product with the introduction of *VisiCalc* for the Apple II in 1979, a tool that legitimized personal microcomputers in many business environments and led to a remarkable competition that involved not only the original *VisiCalc* but the even more popular *Lotus 1-2-3* introduced in 1983, and emerging heavyweights such as Microsoft's *Excel* that appeared in 1985 for the Mac and 1987 for the PC.

Reviewing Word Processing

However important the spreadsheet in driving microcomputers into the business and personal marketplace, word processing defined the universal utility of microcomputers for academics and other users. Many people needed a spreadsheet, but everyone needed a word processing program.

The evolution of this marketplace followed a now well-known path of innovation that matched software creativity to the expansion of hardware capability. Much of the skill of the early software writers lay in identifying ways to overcome the capacity limitations of the first machines: small memories, limited disk space, constrained screen display, and primitive printers. Word processors capable of overcoming a hardware limitation might gain considerable market share only to be marginalized by a leap in machine capability that made

the clever implementation irrelevant on more powerful devices. For those of us who followed these markets for personal or professional reasons, the rate of change and the multiplicity of solutions proceeded at what appeared to be blinding speed.

One of the places to watch that evolution was through the magazines and newsletters published to guide users through the maze of new software and hardware offerings in the early days of the microcomputer revolution. Many journals no longer exist or have morphed into more traditional hobbyist magazines. *Byte*, the classic bible of the microcomputer revolution, died in the mid 1990s. *InfoWorld* transformed itself in the mid 1990s into a professionally produced semi-business oriented journal, and other magazines just faded away.

In the early days of this process, much of the writing on microcomputers and their software fell to amateurs, hobbyists, and academics who took on the roles of early adopters and wrote about their experiences to guide others. Without standardized products or criteria for their evaluation, the marketplace thrived on the opinions of those who had an opportunity to try the many available versions of machines and software. The reviewers, in turn, often worked for free, or for the opportunity to receive copies of every significant software offering in one category or another.

At *InfoWorld*, those of us who reviewed software served a group of tech-expert editors eager to create standards and quality criteria for reviewing. An elaborate reviewer's guide outlined the process and system we would use to review hardware or software to produce comparable ratings, even when reviews of items in the same category were written by different experts. Over time, reviewers who started out reviewing everything from machines to word processors to spreadsheets to printers, became increasingly specialized around one or another product group, a harbinger of the professionalization that would overtake the small computer publications in a number of years.

Word Processing Models

The word processing world developed within two different models. One we can call the text-editing model and the other the typewriter model. Both focused on the user's approach to creating a written product. The text-editing model imagined an endless roll of paper that contained lines, sentences, or paragraphs of text from beginning to end with little immediate concern for page breaks or page formatting, leaving these issues for a subsequent operation on the completed text. The typewriter model imagined sheets of paper, with text beginning and ending on a page by page basis, each page with correct finished margins and layout. Programs designed around either model could perform all the necessary functions of producing final copy, but they created different working environments for the people involved in the process.

The text editing model derived in large part from the editors available for larger computers and served to support the work of preparing computer programs or producing text for post-processing by the sophisticated formatting programs used for typesetting or newspaper and

magazine production. In these environments, people writing copy have less interest in the final appearance of the text, as they are focused on its content. The text-editing process places a high value on sophisticated tools to find, modify, check, and otherwise manage the raw material of letters, words, sentences, numbers, and other characters. In addition, many users came to the process of computer-managed text through the prior use of punch cards, with their 72 to 80 character per line limits and the resultant post processing that produced readable formatted text. The text editor on screen tended to replicate this 80 character per line model in the transition from card punch to video screen text entry.

The page-oriented model reflected business requirements for formal professionally produced final copy on office stationery or letterhead. Often the material followed standardized forms using formats with relatively straightforward editing requirements. Also much business work involved producing copy directly on typewriters rather than generating copy with variable formats such as computer programs, material for typesetting, and other forms used by academics, journalists, and writers.

Even though both models could deliver well-produced pages of text, they operated differently. The text editor model separated the two processes of preparing text and formatting copy for printing. Text preparation focused on content with minimal attention to the appearance of final printed copy. Once the text (with words, sentences, and paragraphs) was right, a separate formatting program or module would reprocess the edited text into pages and display them on screen or send them to a printing device. This was often ideally suited not only to computer programmers but also to academics or members of the print media who produced text to be processed elsewhere into formatted published pages in newspapers, magazine or journal articles, or books.

In contrast, users of page-oriented programs expected to see their edited text presented on screen formatted exactly or close to exactly as the final product would appear. This mimicked typewriter work where you could always see the line endings and recognize page breaks. The construct of the page dominated the organization of the writing process, and changes or edits required immediate reformatting to reconstruct line and paragraph endings and the resulting page divisions. Page-oriented word processing moved from page to page through the text while text editor programs moved from character to character, sentence to sentence, block of text to block of text without regard to its final appearance on the printed page.

Who cared? The user cared. If the user produced short business letters, repetitive forms, or form letters and other boilerplate documents, often the page oriented model seemed to work best. If the user produced lengthy unique manuscripts, and especially manuscripts for subsequent production by a publisher, the text editor model seemed to work best.

Indeed, during the early years of the battle, two types of hardware based word processing systems emerged. The business world often chose to buy expensive dedicated word processing computers (sometimes based on mini-computers with dedicated terminals such as Wang systems). These provided a standardized and controlled environment for producing

paged text within a corporation. In the academic world and later in most business environments, these dedicated machines gradually lost ground to the microcomputer based word processing systems that could do not only any kind of word processing required but also perform an endless number of other things including spreadsheets and database management, statistical analysis, scientific data collection, computer programming, email, and other tasks.

Reviewing Word Processing Programs

In the early years of reviewing word processing software, we spent much of our time and energy identifying defects in the programs. We checked to see if they crashed with damaging effect. We observed what happened when the program ran out of memory. We tested whether the spelling checker caught hard words. We investigated whether programs' printer modules accurately worked with current popular printers. We reviewed whether the printed text appeared as we expected it to. And, we checked whether the program did all the functions it advertised.

We developed checklists and examples of challenging tasks that could stump or crash the less effective programs. In retrospect, most of what we worried about was the result of the significant hardware limitations of microcomputers in those early years. Small memories meant that the computer could only hold part of any lengthy document in memory and would have to write the rest out to a slow floppy disk drive. The slow processors of these machines could not handle complex tasks quickly (such as reformatting a long document to new line lengths or page breaks), and many programs behaved badly when exceeding the capacity of their hardware. When they hit some limit in the number of words or pages, they could die, often losing all previous work.

Also because of limitations in the hardware and underlying operating systems, ease of use became a major factor. Would users find it hard to edit, format, spell check, and preview the resulting text on screen before printing? Today we take the tremendous flexibility of our small machines for granted, but in those early years, programmers had to make choices between function and ease of use. Many programs had tremendous functionality but were difficult to use. Others, easy to use, could only do a few text-based tasks.

As is the case in any new product marketplace, the leaders had to work exceptionally hard to stay in the lead, improve their programs, and adapt to new hardware capabilities. The stakes were high because word processing, as the universal application for all microcomputers, represented a major market. Even more challenging, the rapid pace of innovation and improvement in microcomputer hardware and the competition among computer and printer manufacturers to implement new features and options, required software designers to upgrade to improve their programs to match update or new hardware features.

Printers in particular caused endless problems. Dot-matrix printers came in many varieties with multiple options, and their daisy wheel competitors offered complex alternatives. Each type of printer had special capabilities related to their unique technical features. Could the printer produce micro-spaced justification of text? Could the printer change fonts and how was that accomplished? Could the printer handle multiple sized pages, did it require special paper, ribbons, or ink? Even today, with all of the standards that apply to many microcomputer devices and applications, printer drivers remain a constant complication as the sophistication and capabilities of printers continue to advance and the special characteristics of their hardware and built-in software create endless variations.

Given hardware limitations of early microcomputers, some of the features we take for granted today as integral parts of our word processing, appeared as options or standalone helper programs. For example, spellers were a major differentiating option. Most of these early word processing spell checkers had various limitations. Some had to be run against the text after it was produced, to find errors through a separate process. Others had small dictionaries without spelling variations or they missed frequently misspelled words. Some spellers were slow and clumsy to use. Thesauruses became a competitive option, allowing users to look up equivalent words and improve their word choice. Among these add-ons, the most difficult proved to be grammar checkers.

English grammar is, of course, a mystery to almost everyone except editors and English teachers (and they frequently disagree on the fine points). The battle for the grammar checker function involved a whole different set of computer software designers who struggled to find ways of implementing high quality grammar and syntax analysis. Most of these programs failed tests of simplicity, usability, and accuracy. We developed test paragraphs with various common grammatical errors to push these early products to their limits. In the end, almost all failed until *Microsoft Word* licensed *CorrecText* in 1992, a product from Houghton Mifflin, and *WordPerfect* countered by including a program called *Grammatik* in its software.

Products

The competition within the context of microcomputer word processing followed a three product progression. In the first instance, the winner was a program called *WordStar*, which became popular for general purpose microcomputers in 1979-1890. This was one of the first fully capable word processing programs, built on the base of a superb text editor and enhanced by an outstanding text formatter. A key characteristic of this word processing program was its computer programming heritage. It implemented word processing features through the insertion of special characters into the text stream. If you wanted to have a word printed in bold, you would enter the start-bold special character before the word and the end-bold character after the word. Then, when the formatter read through the edited text, it would tell the printer to start and stop bolding as needed. This worked great for people of a certain mind set, but it was not ideally designed for ordinary, typewriter accustomed writers. Nonetheless, the power of *WordStar* made it the early standard against which all other word processors were measured and a favorite of academics. *WordStar* also catered to the touch

typist and to writers for whom editing, revising, and rearranging text constituted their primary functions. The program permitted, in addition, extensive customization of its operating functions and actions.

The second winner was *WordPerfect*. *WordPerfect*, introduced for microcomputers in 1980, effectively combined the editing and formatting functions into one screen display, and allowed the special formatting codes to be mostly invisible. However, it had a famous function called "reveal codes" that would open a little window at the bottom of the screen where you could see what formatting had been introduced and make appropriate corrections as needed.

For some time, both *WordStar* and *WordPerfect* operated in a character mode environment. That means that the computer screen showed the characters you typed at 80 characters per line and perhaps 24 lines per screen, no matter what the ultimate size and characteristics of the text would be on the printed page. Some screens could have more than 80 characters per line or more than 24 lines per screen, but within very modest limits. No graphical presentation of the actual printed page while editing was really feasible. This limited the ability of word processing programs to display exactly what you would see on paper, although they tried through highlighting and other character enhancements to show more or less what would appear on paper.

The third program was *Microsoft Word*. *Word* appeared on the scene in about 1983, but without truly killer features while microcomputer hardware remained unable to address graphical displays of the text as printed. Microsoft, nonetheless, began early to redesign its word processing programs around the characters as individually managed entities. For *Word*, every character as represented in computer memory contained not only the information to tell us whether it was an N or a Z but whether it was bold, italic, Times Roman, or anything else. Now the characters were king, not the string of text that would start or stop being bold or italic in accord with additional characters inserted into the text stream sent to the printer. In theory every character could have its own font, size, color, or any other characteristic. In the early days of *Microsoft Word*, this powerful feature had the drawback of operating slowly and less effectively on hardware running the DOS operating system (universal until the advent of the Mac graphical interface and the subsequent introduction of Windows within the PC world). But while Word didn't get top ratings, and didn't enjoy large market share at the beginning, its model proved to be the best for the next level of hardware and operating systems.

The first Windows machines were not as effective as hoped since the power of the operating system was more than the hardware could handle. But by Windows version 3.1, the world of PC's had clearly changed to a graphical environment. While *WordStar* and *WordPerfect* eventually produced their own graphical versions of word processing, the war was mostly over. *Microsoft Word* and especially its suite, *Office*, came to control the marketplace, effectively ending the word processing wars. The two models of text editing and text formatting came together seamlessly within the Word environment.

Throughout this process we saw a tremendous amount of creativity and innovation in the software designed to assist in the creation of text of every imaginable kind. From truly exceptional text editing programs like *XyWrite* to generic user friendly utility word processors like *Volkswriter*, from huge systems that emulated dedicated word processing programs like *Displaywrite* or *DeScribe*, the variety and creativity of programmers served every imaginable writer's needs.

Today, of course, the standard on both Apple and PC platforms is *Microsoft Word* whose feature rich environment and increasingly tightly integrated office suite create a formidable barrier to competition. But competition there is, and for those of you who like to play, download the free version of *OpenOffice* and see what the open software movement is attempting to achieve as it takes on the Goliath of Microsoft. Or try out the free *Google Docs* online environment that operates in the cloud.

Will the iPad/iPhone/Mac standard win the next round of small computer/software wars? That's a story for next time.

Additional Reading:

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