

## "A 'Perfect' Journey": WordPerfect Helping the World Communicate by Alan C. Ashton

I am honored to be here today to talk about a subject that I have strong feelings about the subject of how technology improves the quality our lives. When Mr. Gould addressed this group two years ago, he outlined some compelling reasons for his establishing this lecture series. One of those reasons was to bring technologists and non technologists together in friendly discourse. Mr. Gould pointed to the stereotypical technologist as one so immersed in work that he or she loses touch with humanity. Mr. Gould said that this one-dimensional character is not at all representative of the many engineers and scientists he has known and worked with in the electrical utility industry. It is also not representative of those I have known in the computer software and hardware industries.

During my years of university teaching and during subsequent years as WordPerfect Corporation's chief executive officer, I have had the opportunity to closely observe and work with some of the best and brightest technical minds in the world. Almost without exception, these individuals have been motivated by making a positive difference in people's lives and by providing something useful. Often these people have taken ideas and inventions which have been the result of work in one area and applied them to another, sometimes unrelated, area. This creation and production of worthwhile ideas and goods bring a great deal of satisfaction to an individual.

Today, I want to share with you the case study of WordPerfect. Some have called the success of WordPerfect a Cinderella story, but actually that is not a very good analogy. First of all, there was no magic involved at WordPerfect just a lot of hard work accompanied by sustained faith in a positive outcome. And second, unlike the Cinderella story, which focuses around one person and one major event (the Prince's Ball), the WordPerfect story involves many bright and energetic minds all working together to find better ways to communicate.

Throughout the ages, the main instrument of communication has been the document. Let's step back in history for a moment.

Anciently, the document was chiseled on stone, sculpted in clay, engraved on metal, and

carved in wood. With only primitive transportation methods, transporting writing materials was difficult. And even when people had access to the materials the writing process was tedious and laborious. Imagine chiseling your business transactions in stone!

People gradually discovered better, more productive ways to work ink on papyrus, parchment, or linen. This solved the problem of transporting heavy materials, and saved people from chiseling and engraving their records, except when more permanent records were needed. However, copying information to share with others remained a tedious, manual task. Oral traditions were very strong for thousands of years, until Johann Gutenberg's invention of the printing press with movable type in the 15th century. As printed materials became more available, people learned to read, and soon they began sharing information through pamphlets, books, and newspapers. Eventually, individual typewriters helped people become more effective communicators.

About 25 years ago, the first computers and word processors began to appear. The early word processors were awkward and difficult to use, and I remember thinking at that time we had a long way to go.

As I was finishing my Ph.D. here at the University of Utah in computer science, I made two proposals for summer research grants. One was for additional equipment and research on our computer music project, where I had connected an electronic organ up to a computer; and the second was for designing and implementing a computer word processing system for the Computer Science Department. I received the computer music grant, which meant I had to wait for a later time and place for continuing work on my word processing idea.

The computer projects that most interested me were the ones in which the computer was programmed to help me do something I wanted to do. So it was with music. We connected a computer to an organ, such that the computer became the heart. Impulses from the organ keys were sent to the computer, and the computer controlled the tones, the stop settings, and the volume of the organ. We developed a linear music language, and we transcribed a number of symphonies, concertos, preludes, fugues, and other selections of music. We then played these selections on our computer-organ. Thus, we played music "by the numbers."

Under computer control, we could do interesting and fun things with the music. I remember one evening in particular in our computer-organ lab at BYU; we were listening to and watching

some Bach preludes and fugues. We had programmed the computer to graph the music on a video display while the music was being played. We could watch the music using different methods of display. Using one method, we could see the grand music staff with squares and diamonds representing the notes corresponding respectively to tones of the white keys and the black keys of the organ. With another method, we could see a moving graph of the music, like a player-piano roll on its side, with the high notes on top. With a third method, we could see a psychedelic display that was some complex function of the music being played. We watched the wedges of the Bach "Wedge" Fugue develop on the screen as the notes sounded. The visual cues helped the aural recognition and enhanced our appreciation of the music we heard. With the flip of some switches, we could instantaneously move the music up and down in different keys, and we could even flip the music upside down. Of course we could speed up and slow down the music at will. The noise of the advancing paper tape that was feeding the linear music representation into the computer made sounds like a back-up percussion section. How we entertained and amused ourselves as we directed the computer-controlled music system.

After we were finished working, I left the building and passed by the school's large main frame computer. It was enclosed behind a wall of windows into which I peered. I saw several people in white uniforms. They were carrying stacks of computer paper, tapes and disk packs to feed the printers, tape units and disk drives. I was struck with the impression that here these people were all "serving the computer," whereas upstairs the computer had been "serving" us.

This was a wonderful time of discovery for me. I remember with fondness being taught by some of the greatest minds in the field of computers here at the U: David Evans, Bob Barton and Ivan Sutherland along with the other great members of the computer science faculty. These professors were futuristic in their thinking and were an inspiration to me. They have made a profound and lasting influence on me, and I am grateful unto them.

I discussed with them my frustrations in using the current text editors as word processors. I had used an editor on a large computer to do my thesis. It was a run-off system, which meant I had visible codes in my document to indicate things such as underline, bold face and centering of text. Using this text editor was awkward, technical and frustrating. These early text editors were designed to work with teletypes, which printed at only 10 characters per second (compared with filling an entire display screen with characters and pictures in much less than a second, today). This meant that there was very little feedback from the computer to the person concerning the context of the document being created. There were many commands and codes,

but they were cryptic and very technical in detail.

Before this time, I had been using typewriters. My undergraduate thesis was in mathematics, and I must say that it was a chore to get all of the complex equations properly centered and aesthetically placed on the page with subscripts, superscripts and special mathematical symbols. This meant changing type balls, and retyping pages to get everything just right. Do you all remember manually centering text on the typewriter and leaving just the right amount of space at the bottom of the page for the footnotes? I remember often having to type an entire page over again because I made a small typing error. On large documents, the omission of some text or a change in wording on a page would often mean that subsequent pages would have to be retyped as well.

The nice thing about using the computer for my doctorate thesis was that I could make changes on the computer and then press a button to automatically print the text. I was intrigued by using the computer to help process text. While I taught at Brigham Young University, I worked with a number of students on text formatting and text printing programs. These worked in conjunction with text editors. I began thinking of how to bring the text editing, text formatting and printing together in a more natural process.

Meanwhile, I was working with other students and excited, bright graduate students on the interactive uses of computers, especially in the area of music. This is how I met Bruce Bastian, an impressive student who was then the director BYU'S marching band. Bruce worked with me on a computer program to display the marching band formations. He graphed the band shows in three dimensions, so one could see the formations from a blimp view, from the fifty yard line up high or down low, from the end zone, or from anywhere else around the field! He was so creative and brilliant with this project that I asked him to join with me in pursuing commercial uses for some of my word processing ideas.

Together, we created a very interactive word processing program that ran on a general-purpose computer. This program contrasted with the other major word processors of the time, which used special-purpose machines. We were convinced that we could really make people's lives easier, and we never lost sight of this goal. Friends and colleagues were skeptical and tried to dissuade us from expending our effort on something that could not possibly bring any reward. WordStar had already cornered the market, and we had no experience with creating a business or marketing products. But we went forward on faith. And, as I mentioned earlier, we were able

to take what we had learned by creating our other computer programs and use the knowledge in our new undertaking.

For example, in our music playing program, I dealt with a list of information called a Playlist. And when I wrote music, I worked with it line upon line. I found a way to make changes in the middle of the lists, to turn notes on and off, and to adjust volume settings. When developing WordPerfect, we used the same principles to manipulate the text. I wanted to be able to edit and change the text, and to type or print at any time, from anywhere on the page. When I talked to colleagues about how I wanted to be able to move the cursor around in the document and begin to type anywhere, everyone thought I was crazy. And then when I said I wanted the ability to insert text, rather than overwrite, they thought I was crazier still. "That's just not the way it's done," they told me. At the time, if I wanted to edit text, I had to push a button, open a space, type the text, and press a button to have it entered. But I wanted the insert to happen automatically. I thought the computer should work harder to make things more natural for people.

In 1979, we incorporated as SS1 (Satellite Software International) and began doing business with some very simple goals in mind.

First, we wanted to write clean, elegant, easy-to-use software that would help people be more productive in their work.

Second, we wanted customers to trust us and our work. We determined that we would immediately fix any problems our customers encountered.

Third, we decided that we would grow our business only as financial resources became available. This was the beginning of our "debt-free" policy.

Fourth, we wanted to make enough profit to provide a modest living for our families.

Our first customer was Orem City. The city was in the process of purchasing Data General computers, and the DG did not have a word processor. We agreed to write the word processing software for a very low price, if we would be allowed to retain intellectual property rights to the software. Bruce worked day and night on the project, and I worked nights and Saturdays while continuing to fulfill my teaching responsibilities at BYU. We worked in the basement of the

Orem City building, and I believe that one of the reasons our word processor eventually became so successful was because we had immediate access to our customers, and we used the feedback they gave us. The Orem City secretaries used the software during the day, and in the early evening, we talked to them about their experience. We asked them what they liked about the word processor we were creating and what they would change if they could. They gave us suggestions about how to make the software more intuitive. After the secretaries went home, we worked into the early hours of the morning making the changes they requested. When the secretaries came to work in the morning, they tried out the changes we had made. One step at a time, we customized the word processor to the needs of our customers, and they were delighted. They quickly spread the word about WordPerfect, and requests began coming in so fast that we scrambled to handle them. We began to hire a staff, and as our customer-base became more geographically distant from us, we all began to take customer service calls. In other words, every employee was also a customer service representative.

Our first foray into the international market came in answer to a request from a DG customer in Finland. The customer had heard about our product, and they came to Orem to have a look. The next thing we knew, the customer had arranged for translation, and Bruce was on a plane to Finland to get the product up and running. He completed the job in only 72 hours. That was 1980, and today, Data General Finland is still one of our international dealers. Switzerland and Germany were next, followed by Sweden and England. They all wanted WordPerfect on their DGs. More and more interest was expressed, and after the PC version was released. Bruce decided to take a trip to the Hannover fair in Germany. He was bombarded with questions, and came away knowing that if he could provide localized versions of WordPerfect, many more people would love to use the product. This was an interesting time for us, because we were almost totally in reactive mode. In a few cases, we did seek out an international distributor, but in most cases they came to us.

Today WordPerfect is available in 28 languages in more than 100 countries, and before the merger with Novell a few months ago, WordPerfect was the fourth largest PC software company in the world. Today, the new Novell is the world's third largest software company.

I think it is important to emphasize that Bruce and I did not start out to build a huge international enterprise. From day to day, we were concerned about making communication easier for one customer at a time. We set out to understand individual customer needs and to find the technical solutions that would meet those needs. As it turned out, custom solutions for

one customer also worked for other customers.

This ability to create a product that many people could use in their own ways is something we now call "mass customization." In this process, we give the high attention to detail that early silversmiths gave to the work they performed for their wealthiest customers. With customer input, we develop software programs that can be adopted by different customers and adapted to their distinct environments. In this way, we can give customers exactly what they want, and at the same time, we can offer pricing benefits that are made possible through economies of scale. The path we chose ultimately led to the corporate mission of Helping the World Communicate.

As I look back on my experience with WordPerfect, I see some common threads running through the years. First, we were liberal with our customers and conservative with ourselves. Our commitment to customer service was 100 percent, and today our support services are a legend both in the computer industry and in the customer service industry. And the company benefitted from our decision to conduct business on a positive cash flow basis. When we needed a new building or additional computer equipment, we saved for the purchase. This policy insulated us from the effects of fluctuating interest rates and cyclic income streams.

The second thread I see is a commitment to our community. At the end of 70s, the Utah economy was not as robust as it is today, and most families had difficulty making ends meet. Colleges and universities along the Wasatch Front turned out thousands of graduates each year, but we had what we called a "brain drain." After graduating, the best and brightest would typically leave the state seeking employment opportunities. As our business grew, Bruce and I decided that we wanted to share the benefits of success and do our part to help stabilize the local economy. We offered attractive salary and benefits packages to thousands of employees, and we also contracted with many local service providers. At the same time other emerging companies such as Eyring Corporation, Evans & Sutherland, and Novell, began recruiting and employing highly skilled and educated workers. The results have been tremendous. Together we have established an environment that, during the past decade, has spawned hundreds of technology firms in Utah, bringing a high quality of life to thousands of families.

In addition, at WordPerfect, we have tried to be quietly responsive to the humanitarian needs of our community. For many years, we have focused our efforts on providing relief to the homeless and hungry. We have also contributed to quality education by providing opportunities

for individuals and organizations to donate old versions of software to U.S. or Canadian schools. The schools can then receive a new license for the product, including full rights to use and upgrade the old software and materials at education prices, which are much lower than regular retail prices. And last year, WordPerfect gave free software to every K 12 school in the U.S. and Canada that had at least one WordPerfect employee dependent attending the school.

This support of schools is very important to us, although I once heard otherwise. One of my associates at BYU approached me saying,

"You know, you have done students a great disservice."

This remark took me a little by surprise, but my curiosity got the best of me. I asked him to elaborate.

He told me that by putting a spell-checker in WordPerfect, I had promoted mediocre writing. Students no longer had to learn how to spell.

I politely disagreed with my colleague with the following rationale:

A student who does not catch a spelling error while writing a paper often misses the error because he or she does not recognize that the word is misspelled. And typically, the student turns in the paper and does not get instructor feedback for about two weeks. By that time, the student has gone on to other projects and may not pay close attention to corrections the instructor makes. On the other hand, the student who writes and makes use of the spell-checker, gets immediate feedback while he or she is focused on writing the paper. The student gets the information at the moment it is needed, and the computer doesn't miss anything. The student actually becomes a better speller. And because computers make writing easier, students write more and become more proficient at what they do.

Let me give you another example.

Not long ago my daughter Allison had a crossword puzzle to complete for her social studies class. She was stumped by one question and came to me for help. I read the chapter twice and still could not find the answer. The question was, "The Dutch would not work in the fields because they were \_ E \_ \_ L \_ \_ \_ \_ ." We knew two of the letters in the nine- letter answer. We

knew the second letter was "E" and the fifth letter was "L." We had no other clues. I asked Allison if she could think of a way we could use WordPerfect to help us solve this problem. She thought for a moment and then suggested we search for ? E ? ? L ? ? ?. We did, and we found the word "gentlemen." So the sentence read, "The Dutch would not work in the fields because they were gentlemen. " It made perfect sense.

When Allison got to school the next day, she was the only one who had found the answer to that particular question. The answer was not in the text. The teacher had changed the textbook but had not changed the puzzle. The important thing to me was that Allison came out of the experience feeling great about herself because she had solved the problem; I felt good because she had figured out a new way to use the computer to help her get her work done. I don't think we can overemphasize the importance of providing excellent tools to our students and preparing them for the challenges they will face in their lifetimes.

Beyond education, the third thread I see is a contribution to preserving basic human liberties such as freedom of speech and assembly. Over the years, the impact of technology on human liberty has been remarkable. People who would otherwise be isolated from friends and colleagues, can express themselves by fax or electronic mail (E-mail). They can assemble via electronic bulletin boards and wireless communications devices. I was interested to find out that when the students at Tiananmen Square in China communicated with the outside world about the terrible massacre, the famous message they faxed to the outside world was created using WordPerfect.

Another important liberty that we sometimes take for granted is the freedom to compete in an open marketplace. In the computer software industry, we often see organizations that try to monopolize the market, or at least a certain segment of the market. Their motivation is clear. They want to realize as much profit as possible by controlling the supply of all products related to their key products. But the danger to the customer and to the industry is also clear. When customers choose closed or proprietary solutions, they are essentially limiting their future choices. We've seen this with Atari and Commodore, and to some extent with Apple (just try to get the parts you need to fix an Apple IIe). When people purchased these hardware systems, they were relying on the manufacturing companies to continue to provide compatible software solutions. As time went on, and new technology was created and adopted, computers that once offered state-of-the-art capabilities became dinosaurs extinct in only about five years. Former customers were faced with the expensive prospect of purchasing completely new systems.

The truth is that cutting-edge software solutions have been coming so quickly that by the time we get a product into the stores, the next version of the product is already close to being ready for testing. But customers need not be afraid of purchasing today's computer products if they make decisions today that will give them options tomorrow. By purchasing products based on open industry standards, the customer maintains an upgrade path. When new technology becomes available, it can easily be hooked into former technology without the necessity of purchasing a whole new system.

So, my point is that if open industry standards have been important in the past, they will become even more important in the future. As one business reporter recently noted, the center of the computing universe is shifting to the network. And the network provides opportunities for people to be connected in ways that were never before possible. Networks break down geographic and political barriers and bring us closer to the realization of what Marshall McLuhan has named the "global village." We are neighbors with people who live all over the world, and we can communicate with them daily. In this new networked world, open standards is what will allow people to get their work done with the newest and best tools.

For example, can you imagine how difficult communication would be if the telecommunications industry had not adopted open industry standards on a global basis? As it is now, you don't have to know how the PBX system works in order to make a telephone call. You just pick up the phone and dial the number. That's how it should work in the computing industry as well. You should not need to know how the network system works in order to E-mail a document to your friend in New York. And you should not need to know all of the in's and out's of your current software applications in order to use new technology. After all, computers should be serving you, not you serving the computer.

This is an exciting time to be alive. Inventions are coming at a quicker pace than ever before in the history of humanity. You may have heard that during the middle of the last century, the U. S. Patent Office was nearly closed. In his annual report in 1843, Henry L. Elsworth commented, and I paraphrase, that so many new things had been invented that we would soon run out of ideas to patent. Obviously, this has not happened. Let us all hope and pray that it never does.

Thank you.

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