1963: The debut of ASCII

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by Mary Brandel

(IDG) -- If it weren't for a particular development in 1963, we wouldn't have e-mail and there would be no World Wide Web. Cursor movement, laser printers and video games — all of these owe a big debt of gratitude to this technological breakthrough.

What is it? Something most of us take for granted today: ASCII. Yep, plain old ASCII, that simplest of text formats.

To understand why ASCII (pronounced AS-KEE) is such a big deal, you have to realize that before it, different computers had no way to communicate with one another. Each manufacturer had its own way of representing letters in the alphabet, numbers and control codes. "We had over 60 different ways to represent characters in computers. It was a real Tower of Babel," says Bob Bemer, who was instrumental in ASCII's development and is widely known as "the father of ASCII."

ASCII, which stands for American Standard Code for Information Interchange, functions as a common denominator between computers that otherwise have nothing in common. It works by assigning standard numeric

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values to letters, numbers, punctuation marks and other characters such as control codes. An uppercase "A," for example, is represented by the number 65.

All the characters used in e-mail messages are ASCII characters, as are the characters in HTML documents.

But in 1960, there was no such standardization. IBM's equipment alone used nine different character sets. "They were starting to talk about families of computers, which need to communicate. I said, 'Hey, you can't even talk to each other, let alone the outside world,'" says Bemer, who worked at IBM from 1956 to 1962.

Midway through Bemer's IBM career, this heterogeneity became a real concern. So in May 1961, Bemer submitted a proposal for a common computer code to the American National Standards Institute (ANSI). The X3.4 Committee — representing most computer manufacturers of the day and chaired by John Auwaerter, vice president of the former Teletype Corp. — was established and got right to work.

It took the ANSI committee more than two years to agree on a common code. Part of the lengthy debate was caused by self-interest. The committee had to decide whose proprietary characters were represented. "It got down to nitpicking," Bemer says. "But finally, Auwaerter and I shook hands outside of the meeting room and said, 'This is it.'" Ironically, the end result bore a strong resemblance to Bemer's original plan.

If you were to jump ahead to this year, you'd think it was smooth sailing after that. Today, ASCII is used in billions of languages

THIS YEAR IN COMPUTER HISTORY

Technology Happenings

• The Univac I is retired after more than 73,000 hours of operation and given to the Smithsonian Institution.

• Tandy Corp. acquires the assets of Radio Shack (nine stores). Charles Tandy pays nothing. Radio Shack is bankrupt; he agrees to pay the bills.

• MIT professor Joseph Weizenbaum develops the computer program Eliza, which simulates a conversation between a therapist and a patient.

• Digital Equipment Corp. announces the PDP-5, its first 12-bit minicomputer.

• IBM introduces the term "word processing" to sell dictation equipment.

• 4.5 million computer chips are manufactured in the U.S. Eight years later, more than 600 million will be made.

• Ivan Sutherland publishes Sketchpad, an interactive computer drawing system, as his MIT doctoral thesis.

Born in 1963

• Michael Jordan, former NBA basketball star

• Garry Kasparov, chess grandmaster, who lost to IBM's supercomputer Deep Blue in 1997 after beating the computer the previous year

• Mary Brandel, *Computerworld* Flashback writer

Other Notables

• Best Actor Oscar: Sidney Poitier for Lilies of the Field. He was the first African-American male to receive a best actor Oscar.

dollars' worth of computer equipment as well as most operating systems — the exception being Windows NT, which uses the newer Unicode standard, which is only somewhat compatible with ASCII.

- Best Picture: Tom Jones
- Literature Pulitzer Prize: The Reivers, by William Faulkner

However, there was an 18-year gap between the completion of ASCII in 1963 and its common acceptance. This has everything to do with IBM and its System/360, which was released in 1964. While ASCII was being developed, everyone — even IBM — assumed the company would move to the new standard. Until then, IBM used EBCDIC, an extension of the old punch-card code.

But just as ASCII became a done deal and the System/360 was ready for release, Dr. Frederick Brooks, head of IBM's OS/360 development team, told Bemer the punch cards and printers wouldn't be ready for ASCII on time. IBM tried to develop a way for the System/360 to switch between ASCII and EBCDIC, but the technique didn't work.

Until 1981, when IBM finally used ASCII in its first PC, the only ASCII computer was the Univac 1050, released in 1964 (although Teletype immediately made all of its new typewriter-like machines work in ASCII). But from that point on, ASCII became the standard for computer communication.

The story of ASCII wouldn't be complete without mentioning the "escape" sequence. According to Bemer, it's the most important piece of the ASCII puzzle. Early in the game, ANSI recognized that 128 characters were insufficient to accommodate a worldwide communication system. But the seven-bit limitation of the hardware at the time forbade them to go beyond that.

So Bemer developed the escape sequence, which allows the computer to break from one alphabet and enter another. Since 1963, more than 150 "extra-ASCII" alphabets have been defined.

Along with Cobol, ASCII is one of the few basic computer technologies from the 1960s that still thrives today.

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