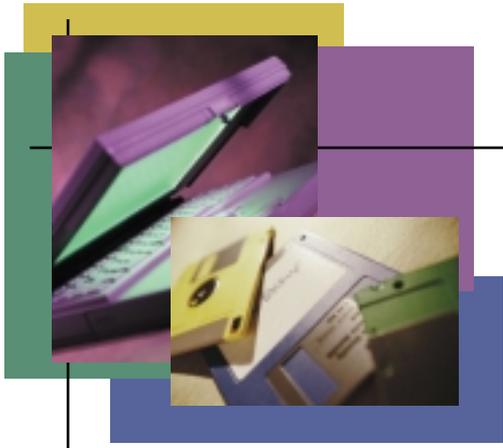


Beware of Imitations



It has been said that imitation is the sincerest form of flattery. In the computer world, it is also often the fastest road to becoming a billionaire and the source of seemingly endless stories of inventors who watched others profit by imitating their inventions. Individuals like Douglas Engelbart and Ray Tomlinson seem completely unaffected by the phenomena. This month's entry, however, was deeply embittered by the experience as he watched a kid ride the wave of his work to become one of the world's wealthiest men.

In 1972, Gary Kildall completed his doctorate while teaching computer programming at the U.S. Naval Postgraduate School. An advertisement for an Intel microprocessor piqued his interest, and after purchasing a chip to experiment on with his students, he called the upstart company to offer the services of his consulting company, Microcomputer Application Associates. Intel had originally developed the 4004 as a custom project, but when the customer wanted to renegotiate the price, Intel shrewdly sacrificed cash for rights to the product. Soon the chip was appearing in everything from traffic light controllers to washing machines, and Intel recognized the need for higher level software support. Thus, Kildall's offer was a godsend, and MAA designed a high-level language for the chip, PL/M (Programming Language for Microprocessors), based on PL/I and Burroughs Corporation's ALGOL. Written to run on an IBM 360, PL/M generated executable binary code that was burned into the chip's ROM. The 8008 and 8080 soon followed, with Kildall adapting PL/M for use on each system, receiving such perks as Intellec-8 and Intellec-80 machines, Intel's microcomputers based on the 8008 and 8080, for use in his classroom. Recognizing the need for input/output devices for microcomputers,

CP/M was wildly successful. By the late '70s, CP/M was running on almost a hundred different machines, including those manufactured by Apple, Radio Shack and Commodore.

the first substantial PL/M program was a paper-tape editor for the 8008 processor.

THE PIED PIPER

Just up the street from Intel another fledgling company was working on floppy disk drives as replacements for the primary low-cost storage medium of the time, paper tape. IBM had invented the floppy disk in 1967 and introduced it to the world in its 8-inch incarnation in 1971. Alan Shugart, the leader of the IBM San Jose Labs, which created the floppy, was a charismatic man with such pronounced leadership skills he was nicknamed "The Pied Piper." When IBM decided to replant the Californian in New York, Shugart uprooted from IBM after 18 years and was immediately offered a position with Memorex. Frequenting Paddock Lounge across from IBM in Silicon Valley to shoot the breeze with his old buddies, he managed to recruit dozens of IBM's engineers to Memorex. In 1973,

he took many of them with him to form Shugart Associates, which invented the Shugart Associates Systems Interface (SASI), which was later rechristened the Small Computer Systems Interface — SCSI or "scuzzy" interface.

That same year Shugart provided Intel with a sample of his 8-inch floppy disk drive. Kildall immediately recognized that the floppy disk was the missing component that could propel the microcomputer from being a curiosity to a viable development machine. "For the first time, it was feasible to dedicate a reasonably powerful computer to the support of a single engineer," he would later write for *BYTE* magazine. Kildall and a friend, John Torode, built a controller interface for the floppy disk unit to an Intellec-80. Mimicking the commands and file-naming conventions of the DEC PDP-10 VMS operating system, and using PL/M, a control program to read and write files on the floppy disk, Kildall and his students then developed CP/M (Control Program for Microcomputers). He attempted to sell the idea to Intel, but Intel, who still envisioned their chips being used primarily as imbedded devices, wasn't interested. Since CP/M and a version of BASIC written to run on it by one of Kildall's students had been developed at a publicly funded institution, the earliest versions were actually public domain software.

After being discharged from the Navy in 1976, Kildall formed Intergalactic Digital Research. MITS, developer of the Altair, and IMSAI were the two leading manufacturers of microcomputer kits. MITS, of course, included the infamous Gates and Allen version of BASIC, which allowed reading and writing to floppy disks through the use of a proprietary disk operating system which MITS foolishly refused to license to

other vendors. IMSAI, desperate to keep pace, purchased a non-exclusive license to CP/M from Kildall for \$25,000. Having been approached by several manufacturers, Kildall rewrote the operating system, making the disk operating portion of the code independent from the hardware-specific routines that he called the BIOS (Basic Input/Output System). He also included an editor based on his earlier paper-tape editor, an assembler and debugger, and utilities. Kildall purchased a classified ad in *Dr. Dobb's Journal* for the \$90 system and was soon flooded with orders.

CP/M was wildly successful. By the late '70s, CP/M was running on almost a hundred different machines, including those manufactured by Apple, Radio Shack and Commodore. Many manufacturers included a ROM-BIOS to load CP/M at power up. The most popular software of the time — Microsoft BASIC, Microsoft FORTRAN, WordStar, dBase — ran on CP/M. Thus, it was only natural that IBM, looking for an operating system for their new PC, would come calling on Gary Kildall wanting to license CP/M-86, a version of CP/M for Intel's 8086 16-bit microprocessor introduced in June 1978.

The first 8086 computer kit was offered by Seattle Computer Products in 1979, but sales were disappointing as consumers waited for a version of CP/M. CP/M-86 was stalled in development while Kildall pursued other projects. Fearing they would lose the advantage of being first on the market, Seattle

Computer Products hired Tim Patterson to write an operating system for the 8086. QDOS (Quick and Dirty Operating System) was essentially a feature-light clone of CP/M.

What happened next between Kildall and IBM is the subject of dispute, each party naturally telling their side of the story. However, Bill Gates was quick to pick up on IBM's dissatisfaction with Digital Research Intergalactic and offered to supply the operating system for the IBM PC. Without any expertise in operating systems, Microsoft purchased QDOS and hired Patterson to modify it for the IBM PC.

IBM offered both DOS and CP/M for the PC, but few consumers were willing to shell out \$180 more for CP/M. Kildall continued to develop CP/M, including multitasking and multiuser versions, but since it wasn't compatible with DOS, few users were interested. In 1989, DRI relented and introduced a DOS-compatible version, DR-DOS, which was critically acclaimed as a superior DOS. However, Microsoft's aggressive marketing tactics, for which they were later sanctioned by the Justice Department, stymied acceptance of DR-DOS. Microsoft included the most popular features of DR-DOS in version 5 and 6 of MS-DOS. In 1991, Novell purchased what was left of DRI.

Meanwhile, Alan Shugart, was fired or resigned, depending on which story you believe, from the company that bore his name. In 1979, he founded Seagate Software.

What happened next, like Kildall's deal with IBM, has been hotly disputed, but the end

result was Kildall died from head injuries suffered after a confrontation with a gang of bikers inside a bar. It is ironic that the man who lost a billion dollars to an imitation of his invention would perish this way. No one was ever brought to justice.

Correction

In the December column, I misspoke. When I noted that Microsoft developed COBOL, Fortran and other languages, I didn't mean to imply that Microsoft invented these languages. They didn't even invent BASIC. They did, however, develop versions of these languages for use on microcomputers. My gaffe was rather ironic considering I will be addressing the evolution of programming languages in the next few columns. 



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