By the Case

CHANGING EXPECTATIONS: COSMIC IN THE NEW WORLD

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Twenty years ago, in the olden days, computer software was a specialty niche open only to gurus who were willing to devote years of study to the field. In the last three years the picture has changed. With the advent of comfortable user interfaces, word processors, spreadsheets, and easy-to-use databases, almost every secretary in the country is conversant with computer technology and their bosses are catching on fast. The result is a heightened awareness of computer software. COSMIC, a long-established, non-profit software distribution facility devoted to technology transfer, is reviewing and revising its operations, trying to meet the expectations of a wider audience.

COSMIC is an acronym, registered to the National Aeronautics and Space Administration (NASA), Software Management and Information Center. It was created in 1966 under an agreement between NASA's Marshall Space Flight Center and the University of Georgia by which the university would distribute Marshall's software and recover its distribution and record-keeping expenses from the public. This arrangement freed Marshall's scientists to do research and at the same time meet the technology-transfer mandate that was a condition of NASA's creation.

Born of common sense, the idea was quickly endorsed by NASA headquarters and in 1967 the COSMIC contract was expanded agency-wide. Initially COSMIC was responsible only for the mechanical functions of receiving, controlling, and distributing software, and was operated primarily by clerical employees. Everything that came in the door was copied and sent out without changes. By the middle of fiscal-year 1967, it was apparent that screening procedures for both programs and documentation had to be developed; documentation was coming in handwritten, on media that included paper bags and cocktail napkins. The programs themselves failed as often as they worked, and COSMIC's manual internal record-keeping led to an embarrassing series of delays and clerical errors.

By early 1968, though, the basic system for process control and a library system for storage, retrieval, and distribution were working smoothly.

Over the next two decades COSMIC stayed about the same, adding a service here and there. In the 1970s, for example, it assumed responsibility for the maintenance of selected programs including the famous NASTRAN. But the basic operation and its purpose—technology transfer—has changed little over the years, except for expanding to all NASA-developed software.

BUSINESS AS USUAL

For COSMIC, business as usual begins when a computer program is submitted. The program is logged into the internal computer system and assigned a priority rating. The program and media are backed up, and the program then goes into the queue waiting for checkout. When its turn for processing comes up, the program is installed on a computer of the same type as the one it was developed on and the program is "linked and compiled" to make sure all the parts are there and there are no unusual problems. Over half of the programs received fail this first screening. Problems frequently encountered are: no installation instructions, blank tapes or diskettes, missing files, calls to hardware or software that are not mentioned in the documentation, and sample input or output that doesn't match the program's results.

If a program fails this first test, someone calls the author and asks for help. Sometimes help is available and the problem is quickly resolved. Other times, especially with very large programs that involve several authors, the program is sent back along with a formal written report on the problems encountered. It sounds black and white, but it isn't. For example, there is the question of...
producing a computer system just like the one the program was developed on. No one organization, COSMIC included, can afford to have all possible hardware and software configurations, so where does one draw the line? If everything seems to be there and the author swears by the program, should we just assume that the program will work or should we buy or borrow the $15,000 piece of software needed to check out that one program? If a program is passed with an “Assumed OK,” will the author support it, or move on to another job and abandon users to their own devices? If the program is rejected will the author file a complaint? Needless to say, each problem is resolved under stress.

Once a program has been checked out or waived through the screening process, it is evaluated and added to the inventory. The evaluation process includes preparing an abstract, supplementary documentation based on the check-out process, and pricing. COSMIC has a standard pricing algorithm that has served to sustain the operation over the years, but expectations of the customers have changed. Universities, used to deep discounts from commercial vendors, expect to get software at less than the cost of processing and billing. Government agencies expect that since most of the software was developed with government funding, it should be free. Some authors also advocate bargain-basement prices on the theory that their programs will get wider use if the prices are low. Yet the average program in our inventory sells only 10 copies in a lifetime. The successful programs must carry the rest of the operation if we are to operate on a cost-recovery basis. Again, pricing is a decision made under stress.

The agonizing pricing step behind us, the new computer program is sent to COSMIC’s Marketing Department. Typically, publicity starts with the preparation of a press release which is then sent to appropriate magazines. The same text is then recycled, first to our electronic mail list and then in our quarterly newsletter. If appropriate, the program is featured in one of our “collections” of programs, and many program descriptions are provided to various “directories” of computer software. Then too, COSMIC has a small budget for paid advertising and occasionally features a specific computer program, although just as often paid advertising will feature a collection, catalog, or service. Six or eight times a year, COSMIC also presents an exhibit at a trade show, generally a show that emphasizes engineering.

As a result of this publicity, people phone, FAX, write, circle the numbers in magazines, and send us electronic mail. A trained customer-support staff of four (two of whom also double as technical staff) field phone calls, perform custom searches of the inventory, and answer letters. Customer contacts generated by the marketing effort typically range from 1,000 to 3,000 per month, although on rare occasions they have exceeded 5,000.

SUPPORTED BY HIGH-TECH SECTOR
COSMIC’s customer file reads like a list of high-tech stocks, and it is this sector that sustains the operation. Some examples:

SINDA85/FLUINT (MSC-21528) Used by Consolidated Controls, El Segundo, CA, to perform thermal analyses on components of aircraft, missiles, and space and marine products.

SINDA85/FLUINT (MSC-21528) Used by Corning Glass Works, Corning, NY, to investigate the behavior of various products, including materials used in catalytic converters, at high temperatures.

SINDA85/FLUINT (MSC-21528) Used by Rohr Industries, Chula Vista, CA, for thermal analysis of various hardware configurations.

GASP (LEW-11629) Used by Rockwell International to analyze the transport properties of rocket-system propellant.

CLIPS (MSC-21208) Used by Quotron Systems, Los Angeles, CA, to help develop prototypes of real-time decision-support systems.

SINDA85/FLUINT (MSC-21528) Used by Magnavox Government and Industry Electronic Co, for thermal analyses that aid in the design and reliability of a number of products.

GTRAN (KSC-11288) Used by Fluiddyne Engineering Corporation, Minneapolis, MN, to monitor the transient pressure changes in wind tunnels and air-supply systems.

SINDA85/FLUINT (MSC-21528) Used by Southwest Research Institute, San Anto-