Chapter 8

PROFESSIONAL SERVICES TO THE COMMERCIAL MARKET

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Chapter 8

PROFESSIONAL SERVICES TO THE COMMERCIAL MARKET

8.0 INTRODUCTION AND OVERVIEW

Perhaps one of the greatest motivations for the formation of Informatics was the desire to offer software services to the commercial marketplace. (In this history "GOVERNMENT" refers to the U.S. federal government and its contractors; work for state and local governments is classified as "commercial," since the type of work and the procurement and contactual practices have been more like those of private business.) As Walter Bauer once stated on the formation of the company, "I looked at what other independent software companies were doing, and I knew that my colleagues and myself could do better." Custom or professional software services (to the government), as discussed in Chapter 6, was the earliest business "offering" of the company.

But for the first few years, the company had virtually no competence in business data processing, so the desire to serve the commercial market remained only wishful thinking until about 1964. Professional software services to the federal government was the company's financial backbone during its first several years. As stated in 1965 in one of the corporation's early promotional brochures:

> Informatics, Inc. provides systems analysis, programming, technical communication and specific application services in the data industry. Its interest lies in user-oriented services on any system or application involving incisive and broad knowledge of the processing of information.
>
> . . . Informatics was born of a need to supply high-quality professional services from the user point of view--services to supplement the client staff or to assist in challenging technical areas.(1)

By 1971 custom software services were defined much more specifically as:

> . . . [performance of] a variety of systems software tasks from design consulting to total implementation of large-scale information handling systems. Informatics is staffed to assume total software responsibility including such services as: function requirements specification, systems analysis, systems engineering, program design, implementation, documentation, and system operation. . . .
>
> Informatics experience in applying systems software techniques has involved clients at all levels of government from municipal corporations to the U.S. Government and at all levels of business and industry from retail business operations to giant corporations and public utilities.(2)

The company cultivated its custom services business by relying on its original and pioneering expertise in on-line and real-time systems design, programming and implementation. This focus placed Informatics in the forefront of state-of-the-art computer systems technology during the 1960's. From a base of expertise obtained from performing contracts for the Department of Defense and NASA, the company was able to expand into the commercial market by providing advanced systems capability when on-line and real-time systems began to be adopted increasingly during the late 1960's. This was particularly true for IBM System/360 computer installations since Informatics was highly fortunate to perform several significant systems design and documentation contracts, obtained directly from IBM during its development of the system, which gave the company's technical staff an unusual amount of System/360 programming expertise.

According to Richard Kaylor, this expertise led Informatics to focus on performing the most erudite of custom service contracts. This taste for advanced projects caused the company to frequently assume both project management and systems analyst roles for customers, rather than simply supply its programmers to assist with work overloads. Moreover, as a result of its concentration on communications-oriented, on-line systems, Informatics (perhaps unfortunately) never built up a large capability in routine business data processing applications. Nor did Informatics perform "pure" consulting unless such effort could lead to a software contract. This is best explained by the company's long-range plan for 1971-1975 which stated:

> Pure consulting as an end of itself is beyond the scope of our present business. We do some consulting work, but we are not consultants primarily, nor will we plan to extend our in-house activities to include pure consulting. Our justification for consulting will be that there will be other work obtainable as a result. . . .(3)

During its first decade of operation, Informatics basically stayed out of both the consulting business and support programming services for routine business data processing, providing these services only on an opportunistic basis.

Commercial custom services were performed initially by both Informatics Western and Eastern Operations and then after 1968 by the company's Western Systems Company (headquartered in Los Angeles), and its Computing Technology Company (serving the New York metropolitan area and headquartered in River Edge, New Jersey). Almost all of this work was done for customers in the United States and the majority of it on the East Coast. However, in the mid 1960's, Richard Hill of Western Operations led an effort to obtain programming work in Europe. Major contracts were won with N.V. Philips in The Netherlands and with DataSaab in Sweden. Several general smaller jobs were done in Switzerland and Italy. An office was opened in Amsterdam. However, after the failure to establish a joint venture with Philips (as described in Section 4.4.1), the office was closed and the work dwindled down to nothing.

When Informatics acquired Programming Methods Company (PMI) in 1975, it gained a large professional services company with operations on both the East and West coasts. In addition to a little technologically advanced development, PMI provided a large volume of routine business data processing programming

services and thus made Informatics a leading supplier in the latter market. To minimize redundancy and duplication of efforts between PMI and its own custom services operations, Informatics formed the Professional Services Group at the beginning of 1977, as discussed in detail in section 8.6.2 below.(4)

While custom services offered to the government marketplace dominated Informatics endeavors during early years, the company vigorously pursued the commercial market, steadily increasing its commercial revenues in dollar volume. However, the percentage of all custom services revenues declined in comparison to the company's proprietary product revenues during the same period. The proportion of Informatics custom services business relative to sales of software products and data services declined from 100 percent of all corporate sales in 1963 (amounting to only $150,000 in revenues) to 58 percent during 1973, although it increased in total dollar volume to $10.8 million. This trend continued during the remainder of the 1970's with commercial custom services dropping to 18.2 percent of corporate revenues during 1978. It should be noted, however, that the foregoing statistics give a distorted view of the place within Informatics of commercial professional programming services. Within Equimatics and within Data Services, and to a lesser extent within the application part of Software Products, a substantial amount of related custom programming was done for commercial customers. Accurate data is not available for the aggregate revenues from such sources as they have always been recorded as part of the revenues of the proprietary product or service with which they were associated, and without which they would not have been done.

Nonetheless, with the market size for commercial custom services estimated to increase 13 percent annually from $1.2 billion in 1977 to $2.2 billion by 1982, Informatics continued to pursue the commercial market for custom services, increasing its annual dollar volume for such services to $34M by 1982. As stated in the business plan of 1979:

> The commercial software services business will be maintained and increased. It will be a primary business objective of the Company, but will not receive investments; this business area will continue to operate profitably, and produce a good return on investment with very low risk.(5)

Bauer's policy of not making investments in professional services was based on his belief that the company's assets would best be employed in software products and data services serving vertical markets. Wagner vigorously disagreed. He worried that such investments, though they could bring big rewards, were very risky. He advocated the hedging approach that was so successful in the PMI acquisition (see Section 4.2.13), and urged that every risky acquisition be balanced by an acquisition of a professional services firm. But Bauer believed that there was not enough investment money to do that, so his policy prevailed.(6)

The remainder of this chapter discusses the major projects and accomplishments of Informatics custom services operations through the years. Informatics endeavors in performing custom software services can be divided into the following five service or market areas: 1) systems programs, 2) financial systems and services, 3) production and distribution systems, 4) communications systems and services, and 5) programming support services. Each of

these service areas is discussed in more detail below.

8.1 SYSTEM PROGRAM DESIGN AND DOCUMENTATION

Among Informatics earliest endeavors performing commercial custom services were various projects for computer systems manufacturers. Informatics conducted systems design, test and evaluation, programming of operating systems, compiler development, and preparation of documentation for a number of different computers under development. Among the manufacturers served by Informatics were IBM, Univac, Honeywell, General Electric, Control Data Corporation, National Cash Register Corporation, Scientific Data Systems, Philips and Electrologica (in the Netherlands), and DataSaab (in Sweden). This particular market never became a major portion of Informatics business; however, the efforts with Univac and IBM were significant and figured prominently in the company's history since they gave Informatics the capability to perform numerous systems design and programming contracts for users of both Univac and IBM System/360 computers. The System/360 in partuclar became the most popular third generation commercial computer and provided an abundant amount of business opportunities for Informatics. In 1982 Professional Services Operations East was still doing a lucrative business with IBM maintaining and enhancing systems programs for successors of the IBM 360.(7)

8.1.1 IBM System/360 Systems Programs

Beginning in 1963, Informatics began performing various systems design and documentation projects in support of IBM's development of Operating System/360 (OS/360) for System/360 and TimeSharing System/67 (TSS/67) for System 360/67. Over 25 of these contracts had been performed by 1967, amounting to cumulative revenues of $2.75 million, with $1 million recorded in the latter year alone. Initially these contracts were obtained by Western Operations, first by Richard Hill and later by Richard Kaylor, both under the direction of Frank Wagner. In 1965 when Eastern Operations Northeast Division was formed under the direction of Richard Kaylor, reporting to Werner Frank, responsibility was transferred there. At the height of its contract performance for IBM's Poughkeepsie (OS/360) and Mohansic (TSS/67) operations, Informatics had a total of approximately 30 personnel devoted to this area. Key project managers included Wilson Cooper, Fred Braddock Robert Heckathorne, and Fred Rose. Among Informatics most significant projects for the System/360 were design and programming of several executive control programs; design and programming of a portion of TSS/67; a timesharing operating system; preparation of a user's installation guide for the System/360 operating system and several other technical manuals; and the design and installation of a "control and reproducibility monitor" used to test operational performance of the computer during production. Some of these projects are described below.(8)

8.1.1.1 Control and Reproducibility Monitor (CRM)

Very soon after the announcement of OS/360, Richard Hill and Robert Heckathorne sold IBM on the need for and technical feasibility of a program to facilitate "checkout and testing" of OS/360. It was based on a concept by William Cutler (then at IBM) who later became a manager of MARK IV development for Informatics. It would ensure "that the execution of each set of programs that runs under the control of the monitor can be duplicated." Called the

Control and Reproducibility Monitor (CRM), the system recorded operating errors and the conditions under which they occurred during testing of programs on various System/360 configurations including all types of attached peripherals (printers, disc drives, tapes, and terminals). It could then reproduce these computer runs, duplicating the same errors so that IBM's programming staff could identify and correct them. The first contract, begun in 1965, was worth $80,149 for OS/360. A subsequent contract, for $37,900, adapted CRM for TSS/67. Robert Heckathorne was project manager for both. He believes that IBM's later development of the Virtual Memory Operating System (VM/370) had its roots in CRM, since many of the techniques used are the same. These projects gave Informatics advanced technical knowledge and familiarity of the System/360 prior to its initial delivery to many customers. The company later used this capability to obtain programming contracts from System/360 users. The technology of CRM was the foundation for the later development (re-invented by others) of software products for performance analysis and evaluation. These became very popular in the 1970's. Informatics may have missed an opportunity by not exploiting CRM as the beginning of a performance analysis software product line, after MARK IV had proven the viability of the concept of an independently developed and marketed software product.(9)

8.1.1.2 Linkage Editor (FLLE)

During 1965 Informatics obtained a firm fixed price contract from IBM Poughkeepsie to perform design and programming of the F-Level Linkage Editor (FLLE). It was one of many programs required for OS/360, the System/360 operating system, which had several linkage editors. "F-Level" (referring to the size of the Model 360 it was expected to run on) was the most sophisticated and eventually most used of the lot. As such, it was a crucial component of OS/360 and the pressure was great to produce a high-quality program on schedule. The purpose of FLLE was "to provide the address linkages required to generate an executible program (load module) from many separately assembled or compiled routines and/or subroutines (object modules)" for System/360 configurations with at least 40,000 bytes of core storage (typically much larger) and at least one direct access device. The linkage editor thus enabled programmers to divide programs into several sections or subroutines, each with its own control features, which could be called by the editor from a standard operating program library. The job was done on time, at a nice profit, by a staff of six people with Fred Rose as project manager, working under the close personal supervision of Richard Hill.(10)

8.1.1.3 System/360 Operating System Documentation

In 1965 Informatics Technical Communications department under the direction of vice president Jackson Granholm began performing several projects to prepare various sets of documentation for the System/360 computer for IBM. Perhaps the most unusual project, performed for fixed price of $25,000, was the creation of the Management Guide for Operating System/360. The purpose of the guide was to aid potential System/360 users in selecting the appropriate operating system, to educate them on how to identify the critical decision factors in choosing the operating system, and to point out that the operating system can be tailored to accomodate any application the user may have. What made this guide unique was the method of its preparation. The guide described three possible hardware configurations representative of large, medium and small System/360

installations by utilizing hypothetical case studies for each of these situations. Informatics prepared the case studies or examples by performing simulation exercises using three teams acting out, within a hotel conference room, the process of configuring the operating system for:

A. A major industrial organization with broad based dataprocessing activities in problem-solving, engineering design, scientific and business applications, test data processing, and teleprocessing;

B. A light manufacturing company with data processing applications in the area of inventory control, accounting, parts listing and cataloguing, and engineering design; and

C. A typical IBM 1401 computer user who planned to install a 360 Model 30 for general business and accounting applications.

The teams were made up of Informatics managers playing the roles of executive decision-makers, financial officers, end users and data processing department management. Among the participants were Walter Bauer, Werner Frank, Frank Wagner, Richard Hill, and Marvin Howard. Working from an appropriate agenda, they improvised the (sometimes acrimonious!) debates that their wide experience indicated would usually transpire before coming to the right decision. Granholm and his staff recorded the impromptu, acted-out scenarios and from them prepared the text of the guide within 45 days.(11)

In addition to the management guide, Informatics personnel prepared the basic volume of the software documentation for Operating System/360, IBM Operating System/360: Concepts and Facilities and provided technical editing for several Operating System/360 System Reference documents including the user technical manuals on the linkage editor, data management, control program services, utility programs, and job control language. Informatics also provided publication consulting services to IBM for documentation related to TSS/67, described below. This effort included development and maintenance of the overall TSS/67 publications plan, writing of key documents, and technical editing. Among the TSS/67 publications authored by Informatics were "TSS/67 Concepts and Facilities", Assembler Language Programmer's Guide, and TSS/67 technical publication workbook specifications for programmers including publication standards and practices.(12)

8.1.1.4 Timesharing System/360 Model 67 (TSS/67)

In 1965 Informatics obtained a contract from IBM Mohansic to provide programming support for development of TSS/67, a timesharing operating system for the System/360 Model 67 computer. Model 67 was IBM's first use of virtual memory--the subsequent IBM 370 computers used similar techniques. Company personnel participated in the areas of program testing, system testing, and system supervisor design. Informatics produced a test control system and a report generator and analysis program. In the area of system supervisor design, Informatics aided in "the study, analysis and detailed design of all aspects of the supervisor for all releases of the Time Sharing System." Informatics personnel also participated in an acceptance certification project for the

TSS/67 time sharing system. "This effort involved the design of a series of tests, under controlled conditions, which thoroughly exercised all elements of TSS to assure working productive software on delivery of equipment."(13)

The project was performed at IBM Mohansic with Informatics having a total of 23 personnel assigned to it under the direction of Richard Kaylor. The company received the contract as a result of experience gained from prior work performed with the United States Air Force's Rome Air Development Center where it had designed an advanced timesharing, paging, executive control program for a multiple computer system. TSS/67 was one of the first modern timesharing operating systems developed for a commercial computer. Although it appeared promising, IBM's Cambridge Science Center developed a competing system, the Cambridge Conversational Monitor System (for the 370, under the name of CMS), which proved easier to use and eventually became more popular, according to Frank Wagner. TSS/67 however, was successfully installed for many customers and used for a long period of time.(14)

8.1.2 Systems Programs for Other Computer Manufacturers

Utilizing previous experience gained during 1963 from projects performed for the United States Navy's Pacific Missile Range, which used Univac equipment in a multi-computer radar tracking system, Informatics obtained two contracts with Univac itself for projects related to the Univac 418 computer. The first of these, under Bob Heckathorne, was for a generalized sort program capable of operating in a real-time and multi-computer environment. The features of this program included generalized input and output (either magnetic tape or the Fastrand drum), two external sort modes, user specified parameters to permit customizing the sort routine for individual applications, and a choice of four standard character sets and user specified collating sequences.

Another project consisted of subcontracts performed for Univac for programming a computerized communications message-switching system being installed for Trans-World Airlines (discussed in Section 8.4.3 below). Informatics has also prepared sort/merge programs for the Honeywell 8200 and SDS Sigma 5 computers. Northeast Operations had a small contract to assist IBM in the development of a portion of their Programmed Airlines Reservation System (PARS).

The company has had modest experience in software languages, compilers, interpreters and assembler programs, and it has performed projects for computer systems manufacturers developing input/output programs for various computers. Input/output executive software was designed for a full line of NCR computers. In language development, the company did an extensive analysis for IBM of PL/1 when used in real-time systems. In the area of compiler development, Informatics has created FORTRAN compilers for the CDC 1700 and CP 642B computers, and JOVIAL compilers for the IBM 709, IBM 7090, GE 635 and Univac 418 computers.(15) A COBOL compiler was created for DataSaab D22, and another was almost completed for the Electrologica EL-X8 when that project was abandoned due to Electrologica's failure to complete an operating system.

8.2 FINANCIAL APPLICATIONS

Informatics Northeast Operations began, in about 1966, to perform work for financial institutions, including First National City Bank and The New York Federal Reserve Bank. The company took a major step forward in advancing its commercial professional services business during 1968 when it acquired Computing Technology Inc. (CTI), as described in Section 4.2.4. A custom software services firm headed by Harold Richmond, CTI primarily provided systems design, programming and installation of financial applications for the New York City area stock exchanges, securities brokerage houses, and banks. Informatics merged its Northeast Operations Division into CTI during 1969. This new entity was named Informatics Computing Technology Company (CTC) with Richard Kaylor appointed as its general manager and president. Through CTC, Informatics gained a strong foothold in the Wall Street area financial systems market. Among the prestigeous customers subsequently obtained by CTC were both the American and New York stock exchanges, Dean Witter and Company, Bankers Trust, and Dun & Bradstreet.(16)

CTC enabled Informatics to provide not just financial applications (encompassing standard accounting, monetary transfer, money order and travelers check processing, securities control and transfer, and brokerage house commission applications) but communications systems as well. Under Kaylor's leadership, separate divisions were established: Business Systems (BSD--30 employees) and Communications Systems (CSD--50 employees). BSD was first headed by George Schussel, then Ira Smolev, but did not really flourish until Walter Brown was appointed vice president and general manager. CSD was built up by Walter Levy, who was succeeded by Charles Reilly.

Forecasting the financial applications market to increase from $665 million during 1972 to $2.238 billion in sales by 1978, Informatics vigorously pursued this market during the 1970's. Utilizing its custom financial systems experience, the Business Systems Division was able to expand its operations into the software products market by acquiring, enhancing and perfecting three software packages, providing accounts receivable, accounts payable and general ledger applications. These packages became the backbone of the company's ACCOUNTING IV product line (see Section 11.8.1 for further discussion). When this happened, in about 1973, the professional services part was placed under the direction of Jack Gelione.(17)

Informatics custom financial software services consist of three major areas: 1) Brokerage house and securities exchange services in New York, 2) commercial banking systems in New York, and 3) other financial systems, performed by Western Systems Company. The more significant projects in these three areas are described below.

8.2.1 Brokerage House and Securities Exchange Services

Through expertise gained with the New York Stock Exchange for a back-office accounting system and the American Stock Exchange for a stock clearing and settlement system, Informatics Computing Technology Company obtained a time and materials contract during 1968 with Dean Witter and Company to provide a back-office brokerage accounting system, initially estimated to cost $750,000. Jack

May was project manager. It was a comprehensive real-time system which provided communications, stock purchase and sales processing, margin accounting, stock record keeping, dividend calculation, statement generation, and fails monitoring functions. Based on a IBM System/360 Model 50 computer, the back-office system routed stock transactions to the floor of the exchange and back after execution while computing commissions, taxes, fees, costs of trade, sending confirmation to the customer, recording necessary data for the exchange clearing houses, and preparing daily reports of daily trading activity for the entire firm and its branch offices. The system also connected Dean Witter's regional offices in San Francisco and Los Angeles with its New York headquarters.

The system became fully installed in 1971 and was hailed by Dean Witter and Informatics as "the most modern and comprehensive in the United States and will be available for installation throughout Wall Street." In cooperation with Dean Witter, the company attempted to market three software packages which it produced from major subroutines of the back-office system. The first of these was a margin accounting system, called INFO-MARGIN, which monitored all customer transactions, verified if they were in keeping with rules of the Securities Exchange Commission, the stock exchange and the brokerage firm, and determined the margin on and value of the securities involved to insure that the value of the customer's stock was worth more than what the customer owed to the brokerage firm. A second package was a stock record system which kept track of all customer shares by security, calculated dividends paid on securities and reported proxies. The final package consisted of a fails system used to monitor other brokerage houses with whom transactions took place to ensure that purchased securities were properly transferred and delivered. Informatics was totally unsuccessful in marketing these systems as stand alone software products or packages to other brokerage houses although they were successfully used by Dean Witter into the 1980's.(18)

In addition to the efforts discussed above, Informatics Computing Technology Company also participated in projects involving development of computer-aided techniques for stock market research, studies leading up to the full automation of data processing functions for the American Stock Exchange Clearing Corporation and the National Over-The-Counter Clearing Corporation, and the design and programming of a Central Certificate System for the New York Stock Exchange which would eliminate the necessity of issuing certificates.(19)

8.2.2 Banking Transaction Systems

Beginning in 1968, Informatics Computing Technology Company combined its financial systems and communications systems expertise to successfully provide monetary transfer systems for commercial banks. The three most significant contracts for these custom services projects were performed for the Federal Reserve Bank of New York, First National City Bank and Bankers Trust.

8.2.2.1 Federal Reserve Bank of New York (FRB)

In 1967 Informatics started a relationship (which has lasted through 1982) with the Federal Reserve Bank of New York, the largest of the regional banks which comprise the U.S. Federal Reserve System. Several study contracts under Fred Bacon led to a time and materials contract to design and develop a very comprehensive money transfer system involving a very sophisticated, fully

automated data communications system. As the system evolved, it became productized as Informatics first ICS IV/500 communications system installation (described in Section 11.6.2). The system connected the FRB's communication center with its funds and securities transfer departments, ten large "money market" second district member banks, and all other regional Federal Reserve Banks. The purpose of the system was to speed the flow of funds between banks and clients, keeping "the money supply working faster for more hours of the day or week." The FRB project grew into a full-scale turnkey contract performed for $2.8 million.(20)

8.2.2.2 First National City Bank (FNCB)

In May 1968 Informatics was awarded a $1 million contract by FNCB to develop monetary processing systems. This project provided the Bank with an international Funds Transfer System, and created a large on-line data base giving ready access to information for the Bank's employees.(21)

8.2.2.3 Bankers Trust Money Transfer System

During 1971 Informatics was awarded a fixed price contract by Bankers Trust for the design and implementation of a money transfer system to "provide the controlled entry and recording of domestic and foreign transfers, confidence in the timely processing of the transactions, and accurate reporting of position and status for customer or management inquiry purposes." The benefits of the system were to eliminate the large volume of manual processing in the bank:

> At the present time, the majority of operations within the Money Transfer department are performed manually. The rapid growth in volumes of transactions, coupled with the problems associated with a large clerical force presents serious problems in the maintenance of high quality service to Bankers Trust customers. Approximately 20 percent of the current work force is dedicated to the handling of customer inquiries and adjustments due to processing delay or error.

Intended to handle 600,000 domestic and 1,000,000 foreign transactions, the design and implementation of the system was estimated to take 51 man months to complete with a staff of 8, in a period of ten months.(22)

The Bankers Trust effort would have been the first computerized money transfer system for a commercial bank to use Informatics new product--the ICS IV/250 message-switching system, based on the Digital Equipment Corporation (DEC) PDP-11 minicomputer, described in detail in Section 11.6.2. However, long after the project was started, Bankers Trust revised upward its estimate of the required daily volume of transactions to be processed by the system. This volume was much larger than the proposed ICS IV/250 could handle. Informatics did obtain from DEC a Sigma 5 emulation unit (which enabled the PDP-11 to run the ICS IV/500 software), and memory add-on units to increase the storage capacity of the PDP-11. But it discovered that Digital Equipment Corporation was not interested in providing the necessary support for such expanded hardware systems. New estimates of cost for implementation of the Bankers Trust Money Transfer System were unacceptablee to the bank and the project was abandoned.

8.2.3 Other Financial Applications Design and Programming

Besides projects performed by Informatics Computing Technology Company, Informatics Western Systems Company and later the Data Services Group and Equimatics Division offered various financial custom services during the 1970's.

Informatics Western Systems Company (previously called the Western Systems Division) was the equivalent of Informatics Computing Technology Company for commercial programming except that it served the West Coast and was much smaller in size. Although most of its commercial contracts during the late 1960's and early 1970's consisted of aerospace and defense related projects, the Western Systems Company also performed various small to medium size custom programming contracts for commercial customers. Their very significant project for RCA, the CLETS communication system, is discussed in Section 8.4.2 below.

In about 1967 two projects were performed which involved the earliest efforts at automating the internal operations of local credit bureaus. The work was done for a consortium of bureaus in Southern California called Credit Reporting Systems, and for the Cook County Credit Bureau in Illinois. Robert Heckathorne was project manager for both tasks.

Another significant contract was obtained during 1973 through the sales efforts of Wilson Cooper, president of the Western Systems Company and Tony Lamia, who reported to him as manager of MARK IV application development. This was a $500,000 time and materials contract with Illinois Bell Telephone (IBT) for the design and implementation, using MARK IV for some parts of it, of new personnel/payroll data processing system. The need for this system resulted from directives of the chairman of American Telephone and Telegraph (AT&T), the parent corportation of IBT, ordering installation of common personnel and property cost systems within AT&T's subsidiary companies to permit standardized reporting to AT&T's corporate offices. The IBT project was "both the pilot operating unit for the 'common' system and the subcontractor for system development." Informatics developed the system using both COBOL and its own MARK IV software product. It was originally hoped that if the system was adopted by AT&T that it would provide abundant custom services work for the Western Systems Company and many additional sales of MARK IV throughout the Bell Telephone System. As usually happens in such grandiose schemes, AT&T later changed its mind about installing common data processing systems among its subsidiaries.(23)

8.3 PRODUCTION AND DISTRIBUTION SYSTEMS

Software services for the manufacturing and distribution markets have been vigorously pursued by Informatics since 1966. In 1973 Informatics acquired a comprehensive software package, PRODUCTION IV (discussed in Section 11.8.2), which provided for the control and processing of all essential manufacturing activities including inventory control, purchase order processing, production and shipment scheduling, and engineering bill of material processing. PRODUCTION IV itself never became widely successful as a software product. However, it increased Informatics capabilities in production data systems and led to growth of the company's custom services business for American manufacturers.

During the late 1960's, Informatics Computing Technology Company obtained two systems analysis contracts with Columbia Records and McGraw-Hill for the design and possible installation of wholesale ordering systems known respectively as ORDER IV and PUBNET. While the latter was never actually implemented by Informatics, the performance of system studies for it provided expertise used by Informatics to create similar proprietary data services, ORDERNET (described in Section 12.4.3.2).

8.3.1 ORDER IV

During 1968, Informatics Computing Technology Company obtained a contract with Columbia Broadcasting Systems for the design, programming and implementation of an on-line order processing system for CBS's record division. This system permitted wholesale record distributors to directly place orders using on-line terminals and aided Columbia Records to speed delivery of shipments to customers from its various warehouse locations within the United States. Informatics implemented this system which became known as ORDER IV. Efforts to sell it to other record companies were not successful.

8.3.2 Manufacturing Systems Consulting

In 1973 Informatics acquired a manufacturing production planning and control software package, which it renamed PRODUCTION IV. Although sold as a software product (as discussed in Section 8.11.2), the installation of PRODUCTION IV always required management consulting, customization of programs to meet specific application requirements, customer education and training, and formal systems support and maintenance--all professional services.

When Informatics decided to abandon the further marketing of PRODUCTION IV as a product in 1978, a small cadre of six to ten people under the direction of Harold Josefson was retained to provide continued support to current PRODUCTION IV users, offer customized programming and updating of PRODUCTION IV modules, and provide customized systems consulting and design. Headquarted in Chicago, Illinois, and reporting to Informatics Information Systems and Services, the Manufacturing Systems Division produced approximately $200,000 of profit in 1982.(24)

8.4 COMMUNICATIONS SYSTEMS AND SERVICES

Informatics entered the custom services communications systems market in 1964 when it served as a subcontractor to Univac, performing systems design and programming for the General Services Administration's Advanced Record System (ARS) (discussed in Section 6.4.2). Univac, providing the required computer equipment, was a subcontractor to Western Union which was the primary contractor for installation of the ARS network. Informatics successful performance on the ARS project enabled the company to be selected by Western Union during 1965 to perform systems design and programming for Western Union's own advanced Information Services Computer System. Both this effort and the ARS project allowed Informatics to develop enough expertise in computerized communications and message-switching systems that it was able to develop a standardized communications systems product--the ICS IV/500, described in Section 11.6.2. The remainder of this section discusses in more detail Informatics efforts on behalf of Western Union and several smaller data communication systems.

8.4.1 Western Union Information Services Computer System

In 1965 Western Union awarded a time and materials contract to Informatics to perform systems analysis, systems design and programming for the operational portion of its Information Services Computer System. This was a two-year project, headed by Roy Morris, which eventually yielded $1,108,000 in revenues. The program system designed by Informatics was "a multi-center communications and management information network based on the Univac 418 computer" providing "a broad range of message switching services to both low-speed and high-speed subscribers on a nationwide basis." Performed in two phases, the first phase performed by Northeast Division, "required the implementation of five communications centers and three major data processing centers" (with each one associated with pre-existing communications centers located in New York, Chicago and San Francisco). The second phase of the project, headed by Wilson Cooper and Fred Braddock of Western Operations (who were loaned to Northeast Operations for a year), consisted of conducting a system study for Western Union to determine the optimum design for expanding and updating its network. The primary problem was whether to use Univac 1108, General Electric 635/645, IBM 360/165, or IBM 360/67 computers.

The Western Union project permitted Informatics to become familiar with and expert in commercial computerized message-switching systems. Each Western Union communications center needed to process, store and forward hundreds of thousands of telex and TWX messages for subscribers including provide multiple and mixed address deliveries for telecommunications messages. Informatics personnel developed the system programming requirements and produced control programs for the operational message switches, report generation of traffic statistics, system start-up, automatic billing of customers, tape data file maintenance, and recovery systems. Using the custom services experience gained from the Western Union project, Informatics Computing Technology Company was able to "bootstrap" its way into the software/hardware systems product business via the Federal Reserve Bank contract, which evolved into the ICS IV/500 communications system product.(25)

8.4.2 California Law Enforcement Telecommunications System (CLETS)

In 1966 Richard Hill embarked on a nine month marketing campaign to penetrate the California state government market. The first fruits were in 1967 when he obtained a subcontract from RCA, who had the prime contract from the State of California, for the design and implementation of all the software for the California Law Enforcement Telecommunications System which provided on-line computer telecommunications among all the offices of California's Highway Patrol Department, its departments of Justice and Motor Vehicles, and all the state's sheriff's offices and major police departments. It also provided a connection to Federal Bureau of Investigation criminal files in Washington, D.C. The system was based on four RCA Spectra 70/46 computers (two based in Los Angeles; two in Sacramento) with 1,000 on-line terminals located throughout the state, forming a 20,000 mile long communications network costing $5 million to install. CLETS was designed to handle a daily flow of 35,000 messages, with a peak hourly capacity of 17,000 messages and provided direct access to several large data bases including the Department of Justice firearm file (3 million records), the Highway Patrol's stolen vehicle file (77,000 records), the Department of Motor

Vehicles' files of driver records (11.5 million records) and vehicles (16 million records), and the FBI's files of stolen property (44,000 records), wanted and missing persons (18,000 records), stolen firearms (121,000 records), and stolen vehicle/license plates (161,000 records). In 1968 an office was opened in Sacramento to support the contract.

Informatics contract with RCA was for a firm fixed price of $465,000 and contained provision for penalties of $1,000 for each day late in performing a 30 day, 24 hour per day acceptance test. Informatics had difficulty in staying on schedule, so the initital project manager was replaced in 1969 by Wilson Cooper. He moved to Sacramento, and by a mixture of skilled technical management and diplomatic contract administration completed the project successfully. CLETS became operational in 1970 and was the most advanced law enforcement communications system at that time. It was still running satisfactorily in 1982.(26)

8.4.3 Other Communication Projects

Three other commerical data communications projects are worthy of mention. The TWA project was obtained from Univac in November 1964 for $39,968 under a time and materials contract. Informatics work consisted of preparing an executive subsystem, an operational subsystem, and a utility subsystem for a small real-time message-processing system based in Zurich, Switzerland, and used to tie together all TWA terminals in Europe and the Middle East with TWA's United States message center located in Kansas City, Kansas.

In 1965 a fixed price contract for $37,000 was obtained from the Kansas City and Southern Railway to tie many teletype terminals located along their tracks into a 360/40 computer in their headquarters in Kansas City. Work was started in March 1966 and finished late that year. Robert Heckathorne did the work of modifying the IBM 360 operating system and adding communications control. This was one of the first relatively large networks to be controlled by such a small computer. The purpose of the system was to do normal processing and also talk to stations up and down line at the same time. Informatics developed this program capability long before IBM did.

In 1967 another Heckathorne project was for Dean Witter. The system provided communication between their IBM 360 computers in San Francisco and New York. Its purpose was to transmit records between their New York back office and customer offices in San Francisco. The majority of Witter's customers were on the West Coast but processing was done in New York. The initial contract for $50,000 was followed by one for $35,000 to transmit the same information to Los Angeles offices. Both jobs were successfully completed.

8.5 OTHER COMMERCIAL PROFESSIONAL SERVICES

The following sample illustrates the type of commercial projects carried out in the late 1960's.

8.5.1 State of Michigan/Project ECHO

Informatics first socially oriented custom services contract was performed for the State of Michigan's Department of Public Health to provide systems

design and consulting to develop information handling requirements and the establishment of a dynamic data base used in a program known as Project ECHO to provide regional medical planning. The objectives of the system were explained as follows:

> Project ECHO (Evidence for Community Health Organization) was designed to develop and carry out a continuing appraisal of the social and physical environment and the state of health of the people of Michigan, to provide systematic reporting of this information back to the people in an understandable and timely way, and to provide factual support for the initiation, operation and evaluation of local health programs.
>
> Project ECHO takes place at the local level. The collection, dissemination and use of information are the functions of the local health department. Information is collected by local professionals, environmental specialists and nurses working in teams.

The gathering of information by local health professionals permitted them to obtain first hand knowledge of the health conditions within their community while at the same time providing statistical data needed by the Department of Public Health responsible for monitoring health conditions and implementing health programs on a regional basis. This was a small project providing no more than $50,000 in revenues for Informatics Eastern Operations to devise a standard method of collecting health survey data from various public health offices located throughout Michigan and the creation of a computerized data base.(27)

8.5.2 CBS/1968 Election Night Prediction System

In 1967 Informatics Computing Technology Company was awarded a prestigeous $300,000 contract from Columbia Broadcasting System (CBS) to design and program a very sophisticated computerized election night prediction system for CBS's television network coverage of the 1968 presidential election between Richard Nixon and Hubert Humphrey. The system provided on-line election reporting, data analysis, trend prediction, and remote inquiry functions. Kaylor personally supervised the job under tremendous deadline pressure. This system worked flawlessly all night (unlike the competing computer systems on the other two networks which often blew up) and accurately predicted Nixon's victory early in the evening. This fascinating news was withheld from the public, however, since Walter Cronkite refused to believe Informatics program!(28)

8.5.3 State of California Projects

The CLETS project, described in Section 8.4.2, furnished the opportunity to open an office in Sacramento, California. Reporting to Wilson Cooper, this office successfully sought contracts with the state government. At its peak it had 12 employees, engaged on programming projects for such state agencies as the Department of Education and the Department of Highways. It also had a contract with the "Big 8" auditing firm of Ernst & Ernst, who were designing and installing a new large accounting system in Carson City for the State of Nevada. In the 1970's these markets dried up and the Sacramento office was closed in early 1972.

8.6 PROGRAMMING SUPPORT SERVICES

In virtually all of the previously described projects, Informatics, by contract, had total project management responsibility. In contrast, "programming support" is general purpose professional services, implying the providing of temporary programmers under a time and materials contract, just as is done with lawyers and accountants. These temporary services aid customers with additional staffing for the programming of new systems or other work overloads. Frequently, projects requiring programming support services are directly managed by commercial customers, not Informatics. Sometimes the initial systems analysis and design are done by the customer's data processing staff; sometimes by Informatics. Frequently the customer starts the job, flounders, and turns it over to Informatics to manage. About half the time Informatics personnel serve under the direction of the customer's staff for the duration of the contract. So, about half of the time Informatics will provide project management services in addition to programming for the development of the customer application. Very frequently Informatics is the "de facto" project manager, although the customer's employee is nominally responsible.

8.6.1. Programming Support Services Before 1975

Informatics participation in the programming support market has changed a good deal during the twenty years of its existence. As stated in the introduction of this chapter, Informatics was founded with an expertise in on-line, real-time, and interactive display computer systems when such data processing applications represented the most advanced computer technology available. In its early years Informatics capitalized on this technical expertise by seeking out and successfully obtaining large-scale systems design and programming contracts for the most advanced projects being conceived. Most of these projects were large contracts performed for the federal government. They always placed Informatics in the role of project manager, supervising all aspects of the proposed application, as well as serving as the systems designer and programmer, whether the contract was done for a firm fixed price, for time and materials fees, or (in the case of the federal government) on a cost plus fee basis.

Attracted by the high price levels, technical challenge and the prestige associated with these advanced projects, Informatics limited its pursuit of lower priced, more technically mundane (but more numerous) "everyday" business data processing support contracts until 1970 when the economic recession and the frequent financial risk accompanying large fixed price contracts prompted it to seek more routine "bread and butter" programming efforts. But, fearful of huge losses (see the HUD contract discussion in Section 6.4.3), Informatics adopted a policy that it would not accept fixed price contracts requiring the delivery of working programs. It believed that such contracts had too much of the character of R&D (research and development) activities. Although the company won large programming support contracts with the Federal government (most notably with NASA's Ames Research Center, the Goddard Space Flight Center, Jet Propulsion Laboratory, and the Scientific and Technical Information Facility--see Chapter 6 for discussion), the commercial market for programming support services had become dominated by many small, local companies and a few large, nationwide firms, such as Computer Sciences Corporation, Computer Applications, Inc., and

Progamming Methods, Inc. The result, in the opinion of Richard Kaylor, was that Informatics focus on the most erudite of technical projects caused it to neglect and miss opportunities available for programming support in the business data processing services market. An effort was made to exploit the company's expertise in MARK IV, by providing custom programming for MARK IV users. However, this business was never much larger than $2,000,000 per year. Informatics thus assumed, in the early 1970's, a relatively minor role as a supplier of commercial programming support services. This role changed dramatically in 1975.(29)

8.6.2. Programming Methods Inc.

As described in Section 4.2.13, in 1975 Informatics acquired Programming Methods, Inc. (PMI), a subsidiary of General Telephone and Electronics (GTE) Information Systems Division. PMI was founded in 1965 to provide software services and products by George Langnas and Francis Casagrande, with other personnel from Computer Applications Inc.(which went bankrupt in 1967). Later it was sold to Riker-Maxon, Inc. In 1975 General Telephone acquired the company from Maxon and made it a component of its Information Systems Division which it established to gain entry into the computer systems market, with emphasis on hardware. Under GTE ownership, PMI faired well, growing to approximately 150 people in four operating divisions: systems engineering, information systems, software products and western operations. The company developed a set of telecommunications monitoring software products (see Section 11.7.5 for further discussion), provided systems design and supplied programming support services to both the federal and commercial markets. It actively competed against Informatics Western Division at NASA's Ames Research Center and against Informatics Computing Technology Company in supplying programming services to New York area businesses. In 1975 the part of PMI that was to be acquired by Informatics was producing about $14 million in annual revenues, $2 million from software products, and $12 million from professional services. GTE's Information Systems Division itself, however, had experienced financial losses of approximately $140 million from its hardware operations, and GTE decided to eliminate the division by divesting itself of the holdings within it including PMI. Werner Frank and Frank Wagner joined in urging the acquisition. Werner Frank made the initial investigations and negotiations; later Albert Kaplan and Frank Wagner closed the deal. Informatics moved fast and acquired the company for approximately $235,000.

Werner Frank was put in charge of absorbing this largest of acquisitions into Informatics and, with characteristic energy, he "made it happen," according to Paul Connolly, one of PMI's executives. PMI's software products were put into Software Products Group where, except for SHRINK and CSS, they lost money until they were divested. PMI's founding executive management left, formed a competing company (Lambda Inc., which they eventually sold to General Electric), and took a number of valuable personnel with them. For the management who were willing to stay, Informatics established a generous profit sharing incentive plan, negotiated with them by Werner Frank, to provide them incentive to stay and motivate them to increase the performance of the acquisition.(30)

This one single acquisition suddenly gave Informatics a thriving programming support business with two divisions located on the East and West Coasts, respectively. Informatics Western Systems Company was merged into the PMI

Western Division to form Informatics Programming Methods Western Division (PMWD) under the direction of Paul Connolly of PMI. The professional services part of Informatics Computing Technology Company was merged into PMI's systems engineering and information systems divisions to form Programming Methods Eastern Division (PMED) under the direction of Donald Toy. Connolly and Toy became division vice presidents. Then Werner Frank relinquished direction, and both divisions initially reported to Richard Kaylor from early 1976 until April 1977. At that time Werner Frank resumed direction until the end of 1977. Frank Wagner took over as group vice president of Professional Services from 1978 through 1982. Connolly and Toy both remained with Informatics and soon were promoted to operations vice presidents in charge of Professional Services Operation West and East (PSOW and PSOE), respectively. The incentive plan has been rather successful. PMI produced 11 percent of Informatics revenues and, after profit sharing, approximately 22 percent of its profits from 1976 through 1982.

Although located on opposite ends of the nation, PSOW and PSOE do not have separate geographical marketing areas except for exclusive marketing rights for PSOW in California and for PSOE within a 50 mile radius of New York City. However, each has a defacto geographical "sphere of influence," since PSOW follows a "metropolitan strategy," concentrating on the cities in which it has offices (none of which are currently east of Texas). Both divisions provide programming support services, only on a time and materials basis (rarely for a firm fixed price). Both typically serve 20 to 50 commercial customers at any given time. But they have different areas of focus and methods of doing business. In the government marketplace, PSOW concentrates primarily on West Coast federal government procurements, while PSOE specializes in serving the needs of state and local governments, a market in which it is the leading supplier.

8.6.2.1 Professional Services Operations East (PSOE)

PSOE concentrates on providing the services of professional programmers anywhere in the world, usually to perform routine business data processing programming. Although its only U.S. office is in New York, its style is one of "have job, will travel," and its stable of professional employees consists largely of highly mobile unmarried people who do not object to being moved from job to job, location to location. Many employees are recruited in England, Ireland, and the Philippines, and work abroad and, under temporary visas, in the U.S. PSOE established an office in London in 1978, under vice president Tony Spargo, from which it services the British Isles, Europe and the Middle East. In the U.S. the responsible vice presidents are Bud Becker and Angela Nanni to whom, along with Toy, all projects report. A staff of commissioned salesmen are directed in their efforts by these executives.

Typical customers served by PSOE have included IBM, Dupont, Eastman Kodak, Ford Motor, American Express, Bank of Louisiana, and over 20 state governments, including Alaska. IBM entrusted to PSOE the maintenance and enhancement of many of its software products. A separate "secure" facility was established for that purpose. An interesting customer in 1982 was the government of the Irish Republic, for whom PSOE hired and provided on-the-job training for entry-level programmers. From the London office, under the direction of Tony Spargo, they serve such customers as Lloyds of London, Shell Oil in Amsterdam, and Arabian

American Oil (ARAMCO) in Saudi Arabia. This foreign effort produced $5.5 million in sales with over 100 employees during 1982.

8.6.2.2 Professional Services Operation West (PSOW)

In contrast, PSOW focuses on what it calls Application Development Services (ADS) in which it sells project management services as well as the skills of programmers to support customer applications. These projects tend to be larger. PSOW has permanent staff assigned to branch offices (which in 1982 were located in Seattle, Washington; San Francisco, Palo Alto and Los Angeles, California; Dallas and Houston, Texas; and Portland, Oregon) responsible for providing services within prescribed geographic areas. Each office had a director in charge of operations, and a manager of sales who reported to the vice president of sales. Responsible vice presidents in 1982 were Roger Philips, William Dwyer, Geno Tolari and Francis Phillips. PSOW had standard fixed price schedules for its hourly rate (PSOE on the other hand charged what the market would bear and was frequently willing to negotiate prices with customers).

Commercial clients served by PSOW include virtually every large corporation in the cities in which it has offices. In 1975 prior to being acquired by Informatics, PMI West performed a $4 million project for AVCO to design and implement a 1500 terminal on-line consumer finance system headquartered in Newport Beach, California and providing service to offices located in all fifty states. This was one of the biggest on-line terminal systems ever installed at that time. PSOW has provided $4-5 million of programming services to Bank of America in the past several years, has served Univac in Olympia, Washington, and aided Standard Oil in an 18 month project to redevelop an automated accounting system. With the development of its ADS services program in 1980, PSOW has obtained commercial contracts with ARCO (to program its pension thrift system) and Texas Oil & Gas. PSOW has also served as subcontractor to Univac for the State of Texas performing systems conversion, and with the City and County of San Francisco for the development of a parking ticket processing system. In recent years a new and very profitable area of business has developed in PSOW, the providing of services to support the computer operations of commercial customers. This grew out of the experience gained in managing computer centers at Ames and Jet Propulsion Laboratory.

8.6.2.3 Status of Professional Services Operations in 1982

Stimulated by the profit sharing plan, which has been revised several times, Professional Services commercial business grew from $11 million revenues in 1975 to $34 million revenues in 1982 when it produced $3.4 million in pretax profits after paying all profit sharing incentives. It had 526 employees, and was either the largest or second largest United States based supplier of commercial professional services.(31)

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