Chapter 11

OTHER SOFTWARE PRODUCTS

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11.0 INTRODUCTION

MARK IV and its descendants were discussed in detail in Chapter 9 and those products which perform insurance industry applications were described in Chapter 10. This chapter completes the history of Informatics software products business by discussing all the company's other software products.

Having proclaimed the development of "proprietary software" as a major corporate objective at its inception in 1962, and believing that volume sales and higher profits could be obtained from software which served a common need of many different users, it was natural that Informatics was one of the first companies to explore the software products market. Informatics first product offering, MARK IV, was developed in 1967. The rapid market acceptance and financial success of MARK IV proved the viability of the proprietary software products concept as conceived by Informatics founders. Soon after the successful market entry of MARK IV, Informatics began pursuing the development, acquistion, and marketing of other potentially successful software products.

The idea of "software products" was not conceived solely by Informatics, although it was a major contributor in formulating the concept and a pioneer in building the independent software product industry. Nor was the idea of standardized commercial software introduced to the world in a ready-made predefined fashion. It evolved over several years into a "mature" acceptable notion of what commercially marketable software was supposed to be and was heavily influenced by the development of computer technology and the great growth in the number of computers used by business in the 1960's.

In 1962 when Informatics was first formed, the concept of "software product" merely existed as a half-formed dream of "proprietary software"--something which newly formed software services companies aspired to create or obtain--which provided a unique capability to use a computer and gave its developer exclusive ownership and sales rights to it. At that time all systems software products and all available applications software products were supplied "free" by the hardware manufacturers--though the latter were rarely used. Possibly the first independently developed software product was a linear programming system, developed by CEIR (one of the early computer services companies) in the late 1950's for the IBM 709/90/94, and sold to a few oil companies. For Informatics, as revealed by **A Prospectus for Corporation D** and early planning documents, proprietary software could be either a standardized computer program, a unique but frequently required computer application which was customized for the particular computer installations of customers, or a specialized data processing service which performed a specific task for customers on Informatics own computers. The key definitional criteria of such proprietary software was that it could not easily be duplicated by others and that Informatics would possess exclusive manufacturing, marketing and licensing rights to it.(1)

The growth of the computer marketplace in the 1960's and the dominance of it by the IBM 360 quickly gave rise to industry needs which led to additional

criteria for proprietary software and permitted the concept of software products to evolve. The following describes the situation as it evolved from the late 1960's through the 1970's and refers primarily to software for large computers. The reader must realize that many of the notions discussed do not apply to the revolution in the software products industry caused by the microcomputer in the first half of the 1980's.

11.1 BACKGROUND

11.1.1. The Market Requirement for Software

The growth in the number of computer installations and widespread acceptance of large-scale computers by business during the early 1960's gave rise to an enormous demand for computer software. As computer hardware made technological advances, the software technology and production capacity that was required to exploit and maximize the use of the increasing number of these more sophisticated computers lagged behind. While computer hardware itself was standardized among the different makes and models of individual manufacturers, the programs available to perform particular tasks and functions on these machines were not. Even mighty IBM did not have the capability to supply this need in any meaningful way. Computer programs required for computer applications had to be custom designed, written, coded and tested for a user's specific needs.

Accordingly, when a company purchased a computer it had to employ its own systems analysts and programmers or contract with outside software service companies, such as Informatics, to write and install the various programs which it wanted. Since the number of educational institutions offering instruction in computer programming was limited in the 1950's and 1960's, an adequate labor pool of computer professionals had not yet emerged. Thus as computers continued to be accepted and purchased by American industry (growing from $1 billion in hardware sales in 1960 to $2.8 billion in 1965 and over $5 billion by 1970), the number of programmers available to design and write custom programs required for the burgeoning number of installations and applications was in extremely short supply, in great demand and lucratively paid. The software services market itself was predicted to grow from $3.2 billion in annual sales in 1965 to $7 billion by 1970.

Many professionals in the software industry, such as Werner Frank, even believed the number of people available to become professional programmers was limited to a finite number of persons possessing the required aptitude and talent, thus creating a higher demand for the programmers who did exist and the precious computer programs which they were able to design and implement. The advances and acceptance of computers so completely outpaced the development of software needed to make effective use of the expensive large-scale machines that the situation was seen as a "growing crisis" within industry at large. By 1966 the United States had a labor force of only 120,000 computer programmers and a minimum need of 55,000 more to meet the then current software services demand. As one Business Week article put it in 1966, "the overriding issue is people--specifically, skilled computer personnel. . . . Already, the supply is far short of the demand, and the gap is widening inexorably. For the foreseeable future, there is literally no possibility that we shall have enough trained people to go around."(2) This statement could still be accepted in 1982, despite the availability of software products.

This severe shortage of programmers caused a few farsighted computer users to seek already existing solutions or programs for common applications to make efficient and effective use of their over burdened and expensive programming staffs. It also caused a few enterprising software service companies to pursue development of standard programs for these applications whereby the programs could be designed and repeatedly sold to various customers using the same computer hardware and needing the same computer application. A market demand for such proven approaches and standard programs to perform specific applications began to arise. This shortage of professional labor and growth in demand for pre-existing software was recognized within Informatics. By 1967 it had determined to devote increasing attention to development of proprietary software even though it had not yet introduced a proprietary offering of its own:

> . . . [Informatics] growth [in professional services] gets more difficult with size and is limited not only by the quantity of qualified personnel who can be attracted, but perhaps more seriously by the number of key managers who can build the business in new geographical areas. Therefore, it is the plan to divert resources to the development of proprietary products and services on an ever increasing basis. This will provide a new dimension for growth, more company stability, and higher profit margins.(3)

This "proprietary" software did not necessarily mean products as we know them today. Proprietary software could and often did imply software "packages" in which the general solution or programming techniques to implement a given application were already determined but the coded program had to be revised or even prepared in entirety to meet the unique requirements of the hardware being used or the individual user before the application could be installed. Within Informatics, programming staffs examined systems design and programming services contracts for indications that an application might be frequently needed by different users and for which a defined solution or approach could be brought to bear for the effective and efficient implementation of it. While this could and did eventually result in standardized software products, the company originally sought to develop custom services programming expertise in particular application areas such as implementation of on-line systems. The idea of an "off-the-shelf" product with a minimum of professional programming services at the customer site did not come into fruition until Informatics acquired Advanced Information Systems (AIS) in 1964 and John Postley, Director of AIS, began development of MARK IV for use on IBM System/360 computers, as described in Chapter 9.

11.1.2. Products Versus Packages

By 1966 Postley had developed a well-formulated concept of what a "software product" should and should not be. To him, a software product was a 100 percent off-the-shelf ready-to-use standard program complete with adequate documentation available under the same terms and conditions to all customers equally, able to be installed without modification in large numbers of installations, and continually supported by technical maintenance, field service and customer training. Implicit in the foregoing was the idea that the customer could rely

on the supplier for ongoing development of compatible new products to meet his expanding needs. (It must be noted that this definition is internal to Informatics and, sadly, has not been adopted by the industry, where the distinction is usually blurred, and the terms "product" and "package" are frequently used interchangeably.) A software product must be an "entity unto itself and can be used by the customer without the purchase of other [software] products and services." A product as conceived by Postley did not need modifications to be implemented by the individual user, nor was it to be modified in any way other than that provided for by its designer. It performed a finite function and generally could not be expanded beyond its design limitations to perform other tasks and functions unless, of course, it was deliberately planned and designed to accommodate certain predefined extensions.(4)

In 1966 Informatics used the term "software package" for a program which could provide the same application to a number of different users, but had to be specifically tailored and modified to meet the unique individual needs of each user. A "package" therefore could not be sold ready-to-use but required the services of a programmer to make modifications to the program prior to its implementation. An accurate explanation of custom software, software packages, and software products is made by Frank Wagner who offers an analogy between home building and software. Custom software, like custom designed homes, is "made to fit" the unique personal needs of the individual buyer. Packaged software is to a large extent standardized but requires a certain limited degree of custom design before it can be used--analogous to tract homes which are built according to standardized floor plans but with each home given its own unique trim, landscaping, floor and wall coverings to suit the desires of its particular purchaser. Software products, in contrast, are comparable to prefabricated "mobile" homes in which the same design and style are used for all units produced and sold ready to use without modification.(5)

The advantage that products had over packages, as seen by Postley and others at Informatics, was that they could easily be mass produced or duplicated without much additional investment for programming services beyond that required for their initial design and updating. Also because they were so completely standardized, products required minimal field service and maintenance. Profits could be maximized and competition could be reduced as recognized by the company's five year plan of 1967:

> Capital expenditures are required. Profit margins can be great--in fact, greater than the profit margins of hardware; once the product is developed, there is no cost of "manufacturing" and only sales costs are involved plus, perhaps, limited initial services to acquaint the buyer with the full product. Furthermore, many of these products have no competitors and, therefore, high profit margins can be achieved.

But Informatics, like so many others in later years, vastly underestimated the cost of marketing the software product. The company foresaw $500,000 of its revenues in 1968 deriving from proprietary products (in this case from MARK IV which was then in development) with this figure growing to $8.4 million by 1972.(6)

The above description does not preclude software products from being upgraded or enhanced in functionality. As discussed in Chapter 9, a number of optional special features were designed and offered for sale for use with MARK IV which gave it expanded data processing and application design capabilities. These special features rather than being custom designed or tailored modifications resembled standard "accessories" (similar to wire wheels, radial tires and sun roofs for automobiles) produced for specific use with MARK IV. A user's modification of their MARK IV system was limited to the number of special features and upgrades offered by Informatics which they purchased. Postley's product concept permitted MARK IV to be designed accordingly rather than as a software package. The quick financial success of MARK IV encouraged Informatics to pursue design and development or acquisition of other software products, in addition to file management systems, beginning in 1969. Each of these that succeeded conformed to the foregoing definition of a "product." Most of them that degenerated into a "package" failed. But just being a good "product" was not, of course, enough to guarantee success. Many failed because the market demand for them was overestimated, and was not large enough to cover the cost of acquisition, maintenance, and marketing.

11.2 THE INFLUENCE OF MARK IV

11.2.1 Summary of MARK IV

As explained in Chapter 9, MARK IV had been developed through experience gained over several years by Advanced Information Systems designing and programming file management systems for several different customers and models of IBM computers. Although costly to evolve into a standardized product, the design and development costs of MARK IV were offset by $500,000 invested by five major corporations who served as sponsors because they were interested in and required such a product. MARK IV was first installed in February 1968 with approximately 100 orders for it already received by Informatics. At a price tag of $30,000, soon raised to $35,000, this file management system, one of the first software products to appear, brought in over $2 million in revenues by the end of 1968 and passed the break-even point with costs by the end of its first year of sales.

Flushed with the success and profitability of MARK IV, Informatics began to take seriously the development of other software products as potentially the best means to grow the company's revenues and profits. It definitely seemed the most effective course of action since during 1968 and 1969 the company had hired and trained a software product sales force consisting of six regional sales offices on three separate continents to sell MARK IV on an international scale. It was believed that this sales force could be utilized to sell other products besides MARK IV and thus further increase the revenues of Informatics. Indeed, this is exactly what John Postley advocated in March 1969 when he proposed that Informatics sell software products other than its own "at less sales cost to a larger market (that is in part captive) than could its developer." Postley desired to solicit software developers to obtain marketing contracts for viable products. He proposed charging interested developers $5000 for a competive/market feasibility study and survey (including the development of price and maintenance schedules), and, if the product seemed worthwhile to Informatics, to offer to market the product for a $20,000 retainer (to pay for

the cost of initial advertising and marketing materials) and a 25 percent commission on sales, including follow-on sales. The developer was to provide all maintenance and customer training but would benefit from Informatics' large MARK IV market and its "good housekeeping seal." Within a short time, however, it became evident that 25 percent of sales was little more than half enough to market a product successfully.(7)

Informatics, in fact, did obtain licensing rights in the early 1970's to sell and distribute several software products including, in 1972, a teleprocessing monitor product (known as INTERCOMM) for computer communications systems from Programming Methods, Inc., a subsidiary of General Telephone and Electronics. The company never made much from marketing software of other companies. Concerns arose about lack of control over the evolution of the product. The desireability of developing additional software products of its own took precedence. As early as September 1968, Postley advised that Informatics expand its product line beyond MARK IV: "It is becoming increasingly evident that in order to remain the potent factor that we are now in the software business, we must begin at the earliest possible instant to expand our product line and to increase our capability to market and maintain these products." Several months later within a five year plan document prepared for software products, primarily for file management systems, Postley enunciated the general belief of Informatics that "within the next five years the majority of all data processing work will be carried out by software products and packages." This strong belief in the bright future of software products was also held by Walter Bauer himself who in a keynote speech at an annual computer systems symposium and Western Systems Conference held at the University of California, Los Angeles, forecasted that user expenditures for outside purchased software would exceed that of in-house developed software during the 1970's with the software product market growing from $700 million in annual sales in 1970 to $7 billion by 1980. At the time this prediction was made custom designed and developed in-house software expenditures by American industry, at an annual investment of $4 billion, outnumbered outside purchased software at least six times.(8)

11.2.2 IBM's Unbundling

One major factor which prompted Bauer's enthusiasm was the decision by IBM to "unbundle" its pricing of hardware and software for its computer systems. IBM, which is the largest computer systems manufacturer and has enjoyed up to 70 percent of the market for mainframes since the mid-1950's, maintained its market position during the 1960's in part by renting its computers and the software for them as one package with a single price. In other words, in the opinion of the naive, the IBM software was provided "free" with computers. Of course there were software costs associated with this pricing, but the cost of the software was buried in the price of the hardware. This practice effectively made it impossible for computer users to make rational price comparisons between IBM computers and its software versus the machines of competing systems manufacturers and the software of independent software companies. Needless to say, there were frequent complaints by competitors that IBM's practice was unfairly monopolistic. Under pressure from the United States Department of Justice, IBM announced in June 1969 that it would sell its hardware and software separately beginning in 1970.

Bauer was the first software executive to state publicly that the IBM decision as a godsend, permitting computer users to make effective price comparisons between independently offered software products and services and that provided by computer systems manufacturers. Believing that independent software would appear more favorable in such comparisons, Bauer considered the IBM unbundling decision as having "far reaching beneficial effects on the industry" allowing the software marketplace to mature at an "accelerated" pace and to "become a multi-billion dollar business in 5-7 years:

> The importance of the IBM separate pricing move is that these changing patterns of the industry will be very quickly accelerated; it will not [sic] be considered de rigueur to buy software and services separately.
>
> The importance to the user in the IBM move is that he will become more aware, more discerning, and more discriminating about software costs and quality. He will become more sophisticated in his business approach to solve problems--he will look to different ways of purchasing expert capabilities which his staff does not possess, or software which can be used to his advantage. In other words, data processing management will be encouraged to take a more business-like approach.

Seeing the unbundling decision as providing an open competitive market for software during the 1970's, Bauer was probably encouraged in his optimistic forecast that purchased software would surpass in-house developed software in the ensuing decade. In actuality, the unbundling by IBM failed to have as great an intital market effect as Bauer had originally hoped. This was due in part to an economic recession during 1970 and 1971 which caused sales of software to drop (but not those of MARK IV) and the stock prices of software companies to decline to extremely low levels, discouraging investment in new products. Nonetheless, during 1969, the unbundling decision seemed to paint a bright picture for independently sold software products and services.(9)

11.2.3 Shift in Corporate Strategy

Acting upon this bright picture, Informatics actively took steps beginning in 1969 to develop and acquire software products as a continuously increasing priority over the pursuit of custom services. In 1969 the company undertook the development of DISPLAYALL, an on-line terminal display implementation product, based upon its custom services experience in providing on-line display systems to agencies of the Department of Defense and initiated a search for other software products which could be developed from its custom services contracts. This led to a significant product development effort from the company's experience in providing systems design, programming and implementation for computerized communications message-switching systems during 1970. The resultant product was a communications system which became known as ICS IV/500 and was eventually followed by a smaller system known as the ICS IV/250. Both ICS IV systems usually entailed the sale of computer hardware as well as software to customers.

Besides in-house development of software products, acquisition was also identified as a major method for the company to build and extend its product

line. While the recession of 1970-1971 prohibited the company from making further investments for software products, Informatics renewed its efforts in 1972 when it acquired a COBOL precompiler product known as CL*IV and proclaimed "other software products" (meaning non-file management products) a major area of new business:

> We expect to be adding quite a number of non-MARK IV software products and we expect this to be a major growth area in the years to come. There are a number of other specifically identified software products from which we expect to receive revenues.

In addition to the acquisition of CL*IV, the company also planned, in 1972, a $70,000 investment for the purchase of a marketing license for PRODUCTION IV, a manufacturing production control product.(10)

Not counting communications systems products, the other software products category was forecasted to grow from nothing in 1972 to $1.6 million in revenue in 1974, $2.8 million by 1975, and $9.1 million in annual revenues by 1978 for a total growth rate of 55 percent over five years from 1974 through 1978. With such a large market potential, a corporate strategy built around software products appeared the most flexible and the most lucrative. By 1973 the sale of software products became the central strategic objective of Informatics as enunciated by its five year plan of that year:

> A company which has system products and software products can participate in the data services industry in many ways: licensing of products, joint ventures, facilities management and tie-in sales with proprietary products. The product company can be a supplier to the data services industry. Every product can be used in a RAIR (Remote Access Immediate Response) environment. . . .

With this perspective, Informatics, while continuing to pursue custom services contracts, consciously shifted during the early 1970's to being primarily a supplier of software products and proprietary information services (see Chapter 7 on information services) rather than a provider of custom software and programming services.(11)

11.3 ORGANIZATION FOR SOFTWARE PRODUCTS

11.3.1 The Earliest Organization

As discussed in detail in Chapter 9, a separate software products organization under the direction of John Postley evolved out of Informatics Advanced Informations Systems into Informatics MARK IV Systems Company (MSC). By the mid 1970's, when other products began to proliferate, it consisted of approximately 135 people devoted to the technical development and marketing of MARK IV. This unit had the international marketing efforts of Informatics S.A., directed by Jeffrey Milton, reporting to it, and possessed a domestic sales force directed by Stanley Feldeman. Product development was headed by Fred Braddock and Robert White managed technical product support of MARK IV directly to the customer (field maintenance, customer education, etc.). Until 1977, MSC

was devoted almost exclusively to the support of MARK IV and had its hands full in managing its explosive growth. However, on a low priority basis, Postley and his team did advise and assist other areas of the company on the development, acquisition and productization of their own software products such as PRODUCTION IV.(12)

11.3.2 Decentralization

The success and profitability of MARK IV caused other parts of the company to seek ways to emulate its status. In the early 1970's, with the active encouragement of the President's Office, software products other than MARK IV, were developed, acquired, sold and supported by other divisions of the company, particularly the company's East Coast commercial services operations, Informatics Computing Technology Company's Communications Systems and Business Systems Divisions. Each division took direct responsibility for technical support and marketing of the products which it had identified and developed or acquired. During the same period Informatics Systems and Services Company developed RECON IV as a basis of proprietary services and attempted to offer it has a product as well. While there was some consulting between divisions or companies, there was actually very little interaction among them because each market was unique. Each division was a separate entity operating by itself with its own field service and sales staff. Coordination and cross fertilization of experience was done by the President's Office.

The fact that these new products of the 1970's appeared within and were sold for several years by its custom services operations reveals that the company's drive to emphasize software products was a significant shift away from custom services activities itself. It diverted the attention paid by management to the basic bread and butter business of professional services. While the company continued to offer professional services and vowed to continue them in the early 1970's, such services were treated as truly secondary in importance to the company. In spite of Frank Wagner's continual warnings against abdicating Informatics market share of the profitable, risk-free professional services business, these services would probably have continued to decline in importance within Informatics had it not been for the acquisition of Programming Methods, Inc. (see Chapters 4 and 8) which had, in addition to several software products, large and very successful professional services operations on both the East and West Coasts.

The development and sale of software products had become paramount and were the main concern of the President's office. This importance is demonstrated by Walter Bauer's own announcement in 1972 of the creation of product manager positions in the corporation and his naming of separate product managers for each software product and proprietary service in the company to directly oversee technical design, user specifications, product planning and marketing strategy for them:

> I visualize that the Product Manager would operate within the same organizational framework in which he is now operating. However, there is one exception. I visualize a dotted line, if you will, from the Product Manager to the President's Office.

> By formalizing the responsibilities, we elevate the position, elevate the person, and elevate the product in terms of its importance in the focus in the Company.

While it can be argued that this was a proper and not unusual action since professional services operations had project and program managers appointed for major contracts and service areas with essentially the same responsibilities as product managers, no project or program manager ever had a "dotted line" reporting responsibility directly to Walter Bauer.(13)

11.3.3 Recentralization into Software Products Group

It was the need to absorb and effectively merge PMI products into its own operations, lest Informatics have separate company divisions competing against each other in the same marketplace, which caused the company to reorganize on a corporate level to eliminate the redundancies and duplications of product activity which had emerged in the early 1970's. As discussed in Chapter 3, Informatics reorganized into four separate product/service groups, effective at the beginning of 1977. This included the creation of a consolidated Software Products Group, commanded by Paul Wrotenberry and later by Bruce Coleman, which took complete charge of development, planning, field support and marketing of nearly all software products throughout Informatics. This business group absorbed the MARK IV Systems Company, Equimatics, and the pertinent software products operations of most other divisions of Informatics. It is was divided into separate divisions for domestic marketing (directed by Stanley Felderman), international marketing (directed by John Postley), technology development (directed by Wilson Cooper), and the Equimatics Division (directed by Spec Bradley). The consolidation of software products under a single management represented the fulfillment of the company's original proprietary product objective and the maturity of this strategy within Informatics.

11.3.4 Further Evolution

Eventually the size of Software Products Group grew unwieldy. There was some belief that systems products and applications products did not belong in the same organization. So after the appointment of Bruce Coleman as executive vice president in 1981, Equimatics was transferred to Information Systems and Services under Richard Lemons. About this time his organization's sale of other software products began to grow with the acquisition of Professional Software Systems (which sold law office management products), the development of MINI MARC, and the emergence of CS V, all of which are described below. At the same time Management Control Systems was acquired and placed under James Porter, vice president of Corporate Marketing and Development in the President's Office. So, by 1982 the responsibility of Software Products Group had been restricted to systems products. The challenge of Informatics in the 1980's and beyond is the identification of new software product markets (especially in the turbulent world of microcomputers), the creation of new technologies and timely products to serve them, and the balancing of resources between software products efforts with those of other growing business areas of the corporation.(14)

11.4 NON-MARK IV SOFTWARE PRODUCTS

In making the decision to expand its software product line beyond file management systems, Informatics sought two general types of products and took different approaches to obtain them. The two types of software were systems products and application products. One kind of systems products, called "implementation systems" by Informatics and "development systems" by many others, (as discussed in Chapter 5) are general purpose in nature and are used to create different kinds of computer applications. MARK IV (discussed in Chapter 9) and most other Informatics data management products are implementation systems. Application products provide a specific predetermined computer application for the end user such as the processing of accounts receivable, payroll or inventory control transactions and do nothing more than the single application for which they were designed. Insurance products (discussed in Chapter 10) are application products. Informatics has always recognized the importance of offering both genres of software products. Systems products for large computers are usually designed with computer professionals in mind, extending the capabilities of programming staffs and permitting systems analysts to implement new systems with a minimum investment of time. Application products are designed with the end user in mind. They provide non-computer professionals ready-to-use computer applications without resorting to the services of internal programming staffs.

Informatics sought both types of products through internal development and by acquisition. The company quickly recognized the risks inherent in developing a new software product from the ground up. There were technological risks--it would be difficult to achieve the desired performance or, later, changes in machine technology could obsolete the product. But much more dangerous were the risks of market acceptance. So Informatics decided that its primary strategy would be to let others do the initial development and introduction to the market. When there was sound evidence that a new product had few technological and market risks, the company would acquire it and the key people associated with it. Then it would apply its marketing skills to selling it and its technological skills to enhancing it. The latter effort was frequently greater than the initial development, because most new products acquired were far from the high quality needed to insure success. But at least the cost was justified because the marketplace had already indicated that such a product would sell.

Chapter 9 discussed MARK IV and its descendants and Chapter 10 discussed insurance products. The following sections discuss several of the most significant other software products which Informatics has offered during the 1970's when it evolved into the leading software products company.

11.5 INTERNALLY DEVELOPED SYSTEMS PRODUCTS

11.5.1 DISPLAYALL

DISPLAYALL was developed during 1968 after the successful introduction of MARK IV. It utilized technology obtained from several custom services contracts performed for the Department of Defense which involved implementation of interactive on-line display terminal systems. The most significant of these contracts was the Display Oriented Compiler Usage System (DOCUS) performed for the United States Air Force's Rome Air Development Center. This project, as mentioned in Chapter 5, involved the creation of a software system, invented by Werner Frank, that demonstrated a method for computer users to develop on-line

applications at a display terminal, creating displays by compiling various predetermined computer programs. The Informatics system made each terminal look to the user like a general-purpose stored program computer with its own display procedure language. The system was based upon "generality" of its various components, largely hardware independent, and permitted users to "extend and modify the program without recourse to professonal programmers" by direct inputs at the terminal.(15)

Informatics realized from this experience that a generalized software product could be designed which permitted computer users to design, install and use their own custom designed on-line displays (such as menus, forms, etc. displayed on the terminal). Expecting the on-line systems market to mushroom in the early 1970's, Informatics, at the insistence of Werner Frank, initiated development of DISPLAYALL for commercial sale. DISPLAYALL was designed and developed by the custom services staff of the Washington D.C. Division of Informatics Eastern Operations which specialized in on-line systems technology for the defense department and other government agencies. The resulting product, the first to be announced by Informatics after MARK IV, permitted easy implementation of on-line terminal displays for large-scale commercial computers and was announced in January 1969 with a sales price of $9,500. The product was initially marketed by the Washington division, and later transferred to the Software Product Development and Marketing Division.(16)

While very future-oriented and advanced in concept for its time, DISPLAYALL contributed nothing to Informatics revenues. Its expected market failed to appear due to the fact that on-line systems were not as rapidly accepted and used in the commercial market as Frank had originally expected. When on-line systems did become popular in the late 1970's on fourth generation computers through the introduction of IBM's Display Management System, DISPLAYALL was by then obsolete. It is interesting to note that in 1980, also at the insistence of Werner Frank, Informatics acquired a product called TAPS, described in Section 11.7.9, which is a contemporary on-line display implementation product designed for use in both mainframe and minicomputer environments.

11.5.2 The INFORMATICOM Effort

It took ten years before Informatics again attempted to develop internally another non-MARK IV oriented systems product. In the last years of the 1970s, the company was facing the question of how it would participate in the coming microcomputer revolution. Werner Frank, executive vice president of corporate development, conducted many investigations and studies and produced numerous white papers describing alternatives. At the beginning of 1980 he initiated Project 80 to define and develop Informatics first product for a microcomputer. The project he defined and designed was INFORMATICOM, and he selected the Ontel microcomputer as its hardware.

INFORMATICOM was an end-user workstation facility for performing data management operations on local files as well as on mainframe files on a coupled basis. It was a hardware/software system which matched a user's local or personal computing needs, balanced by mainframe MARK IV capability, for defining and maintaining files as well as querying and reporting from those files. The functionality of INFORMATICOM permitted a user to solve small to large-scale data processing problems via a screen driven, interactive mode of operation.

The user could be either an experienced MARK IV programmer or a casual MARK IV user. The system was also useful to newcomers to data processing.

The INFORMATICOM machine was a free-standing, intelligent terminal with communications capability, augmented by auxiliary storage and printer output. The system varied in price from $10,000 to $19,000, including the hardware. INFORMATICOM could be useful in the following situation:

(1) Creation, manipulation, and query of personal files held locally in the workstation using software called INFORM/DMS.

(2) Manipulation and reporting of files supported by MARK IV on an IBM mainframe using MARK IV support system.

(3) Selection of a MARK IV subfile from the mainframe and downloading to the workstation for subsequent local operation via INFORM/DMS.

(4) Submission to the mainframe of a MARK IV request, along with an associated workstation local file, for purposes of running a MARK IV report for subsequent workstation output.

INFORMATICOM, through other readily available software facilities, could also be used as:

(1) A state-of-the-art word processor

(2) A networked component of an electronic mail system

(3) A small computer having an operating system and an extensive set of utility software

(4) A remote job entry and output station to an IBM mainframe consistent with standard TTY (Asynch), 3275 Bisynch, and 2780 Bisynch protocols

INFORMATICOM was designed to operate in three modes:

(1) In the free standing mode INFORMATICOM could serve the user as a local data management system with the INFORM/DMS capability. Here one could define and create files, maintain files, merge files, and query from files.

(2) In the coupled mode, INFORMATICOM became an on-line, front end to a mainframe on which MARK IV operated. MARK IV capability was provided to the user for local, screen-oriented input.

(3) The attachable mode made the workstation a 3275-like terminal device as far as the mainframe was concerned.

The system was developed in 1980 and 1981, and a few beta test sites were installed. At the end of 1982 it was transferred to Software Products Group for commercial sale. They were not successful, and with the introduction of the IBM Personal Computer, the product was discontinued after an investment of $1.9 million. But it served to develop a capability in software for microcomputers, which was planned to be exploited for the IBM PC after 1982.(17)

11.6 INTERNALLY DEVELOPED APPLICATION PRODUCTS

11.6.1 MARK IV Application Products

The MARK IV Systems Company initiated development of standardized MARK IV/Application Products in 1973. This involved efforts to create separate business application software products for general ledger, accounts payable, and accounts receivable accounting systems. At first a deal was arranged with a small service bureau in New Jersey called PRAXA Corporation. They had developed a set of accounting applications in MARK IV, and Informatics tried unsuccessfully to productize them. They were eventually abandoned and Informatics was forced to rewrite each program.

MARK IV/General Ledger development was cancelled because it was very late, due to an unsuccessful effort to produce a generator of general ledger programs. MARK IV/Accounts Payable and MARK IV/Accounts Receivable application products were developed and offered for sale. These systems conflicted as product offerings with the ACCOUNTING IV accounts receivable and accounts payable software products (see Section 11.8.1). Nevertheless, these two MARK IV application products were offered for sale for several years until 1977. But prospects, familiar with COBOL and not yet sold on MARK IV, had misgivings about buying an application product written in MARK IV--so the salesman was confronted with a two stage sale.

One MARK IV application product had a modest success. It happened in 1976 almost by accident. There was a joint venture effort with S.G. Leidesdorf (a large nationwide public accounting firm) to develop a MARK IV program to assist auditors in their practice. The product was to be called AUDITALL. The project was unsuccessful, but there had been some publicity about it. In one sales office, there was a demand for it from a prospect. So one of the system engineers in the office wrote a quick-and-dirty application product which he labeled MARK IV/Auditor. It did the job very reliably, so the MARK IV sales force added it to their product line with an initial price of $3,700. Ultimately over 100 were sold.

But the other MARK IV Application Products failed. Several installations were made but they never gained a large customer base or earned much revenue, so they resulted in financial losses. However, they served as marketing lures or inducements to customers to buy a complete MARK IV system by providing demonstrations of its capability and what it could be used for. All but MARK IV Auditor were discontinued in 1977.(18)

11.6.2 ICS IV Communications System

The most extensive application product development effort initiated by Informatics was the ICS IV Communications System which provided computerized

telecommunications message-switching and control. This was an integrated product line in that it usually involved the sale of both hardware and software. It required an OEM agreement with Xerox for resale of their hardware at a higher price, on a "value-added" basis. Thus, it was Informatics first effort in the "turnkey" business, and possibly the first by an independent computer services company. It was based upon Informatics custom services work, between 1966 and 1969, with Univac and Western Union in providing a nationwide message-switching system for the General Services Administration, then for Western Union's own communications network, and finally for a money transfer system for the Federal Reserve Bank of New York. ICS IV was a general purpose large-scale computer communications system which involved the use of two Xerox Sigma 5 (or Sigma 7 or 9) computers (one to handle the interchanage of incoming and outgoing communications, the other to serve as on-line communications backup and as a batch processor for the transactions transmitted.) The original system, the ICS IV/500, was introduced during 1970. Informatics offered both standard communications software (the product software) and custom designed software tailored to the customer's particular needs for the system. The ICS IV was a true turnkey system with Informatics assuming "total responsibility for overall design, hardware, software, and maintenance" before turning it over to the customer's data processing staff after a successful acceptance test and cut-over to production running.

The development and sale of the product was the responsibility of the Informatics Communications Systems Division (CSD), directed by vice president Walter Levy, established during 1970 under Informatics Computing Technology Company, reporting to Richard Kaylor. Other significant managers were Roy Morris in the early days, and later Charles Reilly, Gary Audin and Claus Gruneis.(19)

This system was initially developed as a custom services project for the Federal Reserve Bank of New York by Informatics Computing Technology Company (as discussed in Chapter 8) and installed in 1969. Based upon the use of two Scientific Data Systems (later Xerox Data Systems) Sigma computers, the ICS IV/500 was a turnkey computer communications system priced between $800,000 and $3.2 million, depending on the customer's need for hardware capacity and specialized applications programs. Approximately half of the sales price was for hardware. The successful installation and high sales price of the ICS IV/500 system encouraged Informatics to actively pursue the communications systems business.

The system provided "store-and forward message processing" and could "be used both in a free-standing mode and as the front end for a data processing system." It could "also monitor the operation of circuits, terminals, and connected computers--as well as its own internal elements--and institute corrective action." Designed to handle large volumes of messages, the ICS IV/500 could process 20-30 messages per second. Informatics provided both communications systems and custom software to completely tailor the system to the customer's specific application.(20) The system was the "Cadillac" of computer communications systems and as stated by Gary Audin, director of Systems Projects for CSD:

> Our market is in systems of $600,000 to $2 million and up--very large systems with considerable message processing, or large

combinations of functions that require considerable custom work.(21)

The large sales price, scope, and custom services contract possibilities emanating from the ICS IV/500 system caused Informatics to treat it as a major component in its long-range strategy of the early 1970's. The company's five year plan for 1971-1975, for instance, considered the ICS IV system as a very important product line which would fulfill Informatics future revenue growth needs. Informatics forecastd the large-scale message-switching systems market as approximately $600 million in annual sales during 1970. It was planned that the company could sell ten systems per year by 1975 to provide at least $11.5 million in annual revenues. In actuality, Informatics hoped to sell more than this number. The ICS IV/500 goals were to grow from $2.01 million in 1971 to $16.4 million with an additional $2.5 million in revenues generated from custom services contracts in support of the communications system products.(22)

The first commercial system was sold to Dun & Bradstreet in May 1969 and officially installed on February 27, 1971. This installation provided for the transfer of credit information via teletype between the various offices of Dun & Bradstreet throughout the United States. Dun & Bradstreet later contracted for a second large communications system from Informatics (the Advanced Office System) involving the use of two Sigma 5 and five Sigma 9 computers with over 10 million characters of centralized credit information available to over 100 branch offices in an on-line disc storage data base.(23)

Similar systems were sold to General Foods which interfaced the ICS IV with an IBM 360/65 to provide an integrated computer communications, timesharing and data processing network for all General Foods locations. Licenses for the software only were sold to Mitsubishi for resale by them to KDD of Japan (an international communications carrier), and Japan National Railways which used the system to control and monitor the whereabouts of its rolling stock.

Although several ICS IV/500 systems were successfully sold and installed which provided much needed revenues to Informatics in the early 1970's, the company had wildly overestimated the demand for communications message-switching systems of such magnitude. According to Frank Wagner, the ICS IV/500 was not the "Cadillac" but the "Rolls Royce" of message-switching products. There was a serious question that there was a very wide-spread need for such a coprorate facility, and because the price of such elaborate systems was so large, there were very few potential customers. Competition among supplier companies was fierce. The airlines market was dominated by Collins. A number of companies began offering less capable systems, always underpriced, utilizing minicomputers which were just then emerging.

By 1973 Informatics realized that, to the extent that there would be a computer communications market, it would be for smaller scale systems using a minicomputer. It attempted to develop a smaller system known as ICS IV/250, using Digital Equipment Corporation PDP-11 minicomputers which could process 2-3 messages per second. This system was to use the 32-bit software from the larger ICS IV/500 by an ingenious combination of software simulation and hardware emulation. Special purpose hardware, designed by Informatics and built by DEC, enabled the 16-bit PDP-11 to run the 32-bit Xerox software. It was expected to sell for between $425,000 and $1 million. Informatics attempted to finance this

development by undertaking a $268,000 custom services contract for Bankers Trust to design and implement an electronic money transfer system, buying a PDP-11, and ordering the special hardware. Unfortunately, the daily volume of transactions on the system which Bankers Trust required (which, as the development proceeded, grew to 600,000 domestic and 1 million international transactions) was too large for the hardware initially planned. Bankers Trust was unwilling to spend the money for more hardware, so the project was abandoned. Although the design had been demonstrated to be feasible, Informatics itself was unwilling to gamble on funding a full-scale development effort, since a number of other companies had already successfully entered the smaller systems market. So Informatics discontinued its efforts and exited from the communications market in the recession of 1975 when demand for the ICS IV/500 size systems completely dried up.(24)

11.6.3 The MINI MARC Integrated Turnkey Product

During the 1970's Informatics observed with some concern the explosive growth of minicomputers. The company was not convinced that developing software for them would be a profitable investment. However, an opportunity arose to experiment in this market at little or no cost. As described in Section 7.6, Information Systems and Services Company was performing a substantial amount of work for federal government libraries. Personnel in this unit observed a need for a personal computer to assist librarians in their work. They selected one application and developed a hardware/software system to computerize it.

The application selected was the cataloging function. Every new publication that a library acquires requires that a catalog card be prepared. Such a card is available from the Library of Congress in Marc format on magnetic tape. However, the information is usually far too voluminous for use by the average library, but sometimes does not have information needed by specialized libraries. The MINI MARC system was developed to mechanize the process of creating the libraries' individualized cards. It consisted of a minicomputer with two floppy disc drives, a CRT with keyboard, and an optional printer. Informatics would sell the total system including software for $50,000. But an indispensible part of the system was a subscription to Informatics service of providing the Marc data base on floppy discs, continually updated.

Operation was simple. The librarian inserted the Marc data base disc into the machine and selected the card for the publication just acquired. Using the software and the CRT, the card was edited into the format desired. Then the revised card was written out to the other floppy disc which formed the library's mechanized catalog. It was used to produce catalog cards and listing of the catalog either on the optional printer or at a service bureau.

The product found ready acceptance in libraries on the eastern seaboard. Considering the limited market and the limited marketing resources that Information Systems and Services applied to it, it was moderately successful. It about broke even for several years. However, there was concern that it would eventually begin to lose money, so in 1982 it was sold to the Informatics manager in charge of the product, Frank Pezzanite, who successfully sold and maintained it.(25)

11.6.4 The BIBPRO IV Product

In the course of their work in libraries, the Library Applications Department developed several application programs for the IBM 370. They packaged these together and called them BIBPRO IV. It was a modular software package that accepted data in MARC format and provided the capability of producing, in a batch mode, a variety of bibliographic products, including headed card sets, book catalogs, COM catalogs, KWIC and KWOC indexes, and selected bibliographies. It was marketed on a low key basis, and only one or two were sold. Marketing of the product was discontinued in 1982. But processing services, using BIBPRO IV, continued at the Washington Information Processing Center (see Section 12.5.2) for library customers.

11.7 ACQUIRED SYSTEM PRODUCTS

In addition to developing its own products, Informatics also has purchased products which it felt offered a viable market opportunity. Sometimes only exclusive marketing rights or only complete ownership of the product itself was acquired. At other times an entire corporate entity with all its assets, liabilities, employees, and contracts was acquired. (Such business matters are covered in Chapter, 4, "Acquisitions, Joint Ventures and Mergers.") The following parts of this chapter discuss the characteristics of the acquired products--system products in this Section 11.7 and application products in the following Section 11.8.

11.7.1 The RECON IV System

As discussed in Section 7.2, when Informatics obtained the contract to manage the NASA Scientific and Technical Information Facility, it inherited a version of a commercial software system for the search and retrieval of natural language information from a data base. This was not a true "acquisition" of a system because NASA and its original developer retained "rights in data" (as the U.S. Procurement Regulations quaintly puts it) to the software. However, because of its inefficiencies, Informatics found it necessary to virtually rewrite the entire system. For this purpose it augmented its capability in this area by the acquisition of a small company called Knowledge Networks International, as discussed in Sections 4.2.10 and Section 7.3.1. The result, several years later, was the completion of the development of RECON IV. This was a state-of-the-art system which could build data bases of massive amounts of information in natural language form and retrieve therefrom specific items of information in accordance with criteria specified by the user. In addition to RECON, the retrieval system, it included STIMS for data base maintenance and ITSO to provide on-line system use in a user-friendly fashion. As discussed in Chapter 7, RECON IV was the basis for the enormous growth of information services provided by Informatics. Efforts were made to sell licenses for RECON IV, but without much success. Three or four such licenses were sold for the modest price of $75,000, or leased for $5,000 per month. One reason for RECON's lack of success was a competing product from IBM called STAIRS. Although it was not initially as functionally compete as RECON IV, the market for such products was very small, and IBM's low price of a few thousand dollars per month was enough to give IBM salesmen a big competitive edge among the few prospects for the system. But most of all, it never sold because Information Systems Company made the correct decision of not investing in a large force of software products

salesmen to ferret out the few prospects available, and the company was unwilling to permit the MARK IV sales force to be distracted by assigning them such responsibility.(26)

11.7.2 The CL*IV Product

The first true product acquisition, as described in Section 4.3.1, was CL*IV, a COBOL logic generator, acquired in 1973 and marketed by MARK IV Systems Company. It never became popular. Consequently, the product never produced much revenue for the company, and it was soon abandoned.

11.7.3 The SHRINK Product

SHRINK is a data compaction product which was acquired by Informatics with the acquisition of Programming Methods, Inc. (PMI) in 1975. PMI had previously acquired the product from its developer for $10,000 plus royalties and, at the time of the acquisition, was in the midst of further development. SHRINK permits the conserving of data storage space within tape and disc data files by specialized encryption methods which "squeeze" long data records into fewer bytes. The files are later expanded when accessed for processing or output. Besides saving file space, compacted data also allow faster transmission of files over communication channels. Thus considerable savings can be obtained, up to 80 percent in memory space, disc storage space, and teleprocessing costs.

SHRINK consists of three separate sets of programs. These include subroutines called by the application program to compact data, subroutines which are used by application programs to access compressed data and re-expand all or part for processing, and the stand alone utility described below which optimizes the compaction algorithm. SHRINK was originally designed for use by large-scale IBM System/360 and 370 computer installations under the OS operating system. During Informatics ownership the product was further developed to provide versions to run against IMS data bases and under IBM DOS/VSE. It is a relatively stable program which requires a minimum of field service, maintenance, and customer support. It is easy for customers to learn to use and sells for $10,000 to $50,000, depending on the version.

SHRINK is technically superior to other data compaction or storage saving products and methods due to a "dynamically developed compression scheme" using state-of-the-art Huffman encoding techniques. The "encoding of data is based on a heurestic file analysis wherein the data encoding is uniquely derived for each different file through a file prepass analysis." This technology permits SHRINK to compress data to the maximum amount of compaction possible for each individual file and to perform this compression (or expansion) at the fast rate of 100,000 bytes per second of processing time on a big 370.

Due to its unique data compression capabilities, Informatics foresaw SHRINK's appeal to both large and small system users:

> Nearly every S/360/370 installation is a potential user. A typical user would generally have one or two large (relative to his own environment) files. Originally we estimate that the typical prospect would be the large bank, insurance company, government agency, etc. For these users, files would be many

disk packs or tape reels. However, test marketing results indicate an equally storng interest from the small user whose "big" file might only be a disk pack or two. While the smaller user has a less dramatic savings he seems more sensitive to hardware costs.

In view of lease costs of $5,000 (during 1975) per disc drive spindle per year, SHRINK offered a viable cost effective alternative to hardware purchases of disc storage equipment. Recognizing this universal appeal, the developers of SHRINK forecasted its potential market in excess of $50 million in annual sales (if each System 360 and 370 installation purchased the product) and set an objective of a 1 percent market penetration for annual revenues of $500,000. Sold by Software Products Group, the product has proven very successful. In 1982 it had $3.0 million in revenues and profits of $1.1 million.(27)

11.7.4 The SCORE Product

Another product that came to Informatics with the acquisition of PMI in 1975 was SCORE. Like CL*IV, SCORE was a preprocessor program which generated a program in COBOL. Its functions were those of a simplified MARK IV file management retrieval and report system. By use of "a few simple parameters" SCORE accomplished such functions as information retrieval, report writing, file maintenance, file conversion, etc.

But, like CL*IV and many other COBOL preprocessors, SCORE met with marketplace apathy. Sold initially by the PMI sales staff, and later transferred to Software Products Group, it never generated enough revenues to pay for the costs of selling and maintaining it, so in 1979 it was sold to Software Design Associates (SDA).(28)

11.7.5 The MONITOR IV Products

Along with SHRINK and SCORE, Informatics obtained three "teleprocessing monitor" products from PMI. These "monitors" are an additional layer on the operating system which handles communications between the application program and remote devices, ranging from "dumb" terminals to other computers. In fact, in 1972 Communications Systems Division had acquired a non-exclusive limited license to market the largest and most important of these, INTERCOMM, for royalty payments. The product was believed to be needed to support ICS IV/500 systems connected to IBM System/360 computers. IBM itself did not have a very versatile product for this purpose in the early 1970's. In particular, of course, no IBM product would support non-IBM terminals. So Informatics had to shop elsewhere. At that time the best available product was INTERCOMM. Informatics purchased a limited marketing right to it but never sold one with an ICS IV/500 system. Along with INTERCOMM, in 1975 Informatics acquired with PMI two other products--BETACOMM and MINICOMM- as well. These latter two products were designed for smaller size IBM System/360 configurations and had been acquired by PMI from outside developers on a royalty basis.(29)

The original acquisition agreement with General Telephone and Electronics (GTE) for PMI only granted ownership of the software products in North America, but not marketing rights in Europe. Informatics soon purchased from GTE worldwide rights, or total ownership, to the products within a year and renamed

the entire product line MONITOR IV. The father of INTERCOMM, Ed Opengart, left the company, and the PMI group supporting the development and having responsibility for the products was transferred from PMI to Informatics Software Products Group in 1976.

Unfortunately, all three products had been designed separately and had no internal relationship to each other. This made the heavy maintenance and enhancement required to continue their competiveness and marketability a protracted and costly effort for Informatics. PMI's licenses, granted to existing customers, provided that the software would be compatible with all future versions of IBM operating systems for very small or no maintenance charges! INTERCOMM produced an after-tax loss of $543,000 in 1977 and was forecast to continue to produce losses until 1981. The products were also very complex, making it difficult for the sales force to explain them to customers, and with the largest product INTERCOMM, performance advantages were lost in low message volume installations which used IBM CICS or IMS/DC systems. INTERCOMM (priced at $70,000) and BETACOMM (priced at $40,000) both needed extensive new development to keep up with IBM, necessitating additional investment of resources and continued losses. Only MINICOMM, selling for $12,000, was marginally profitable. By this time IBM had perfected its own communications monitoring products, and competition became very stiff, particularly from CICS/VS. After several years of shrinking sales of all three products and approximately $3 million in losses, Informatics divested itself of them to separate purchasers in late 1978. INTERCOMM and MINICOMM went to Software Design Associates (SDA), and BETACOMM to its original developer, Bengt Holmgren.(30)

11.7.6 The SERIES IV Product

Another venture into the minicomputer software market originated in Software Products International Marketing. Jeffrey Milton came across a small two man company in Switzerland. They had developed a product for the Digital Equipment Corporation PDP-11. Anxious to increase their participation in the then booming minicomputer market, Informatics acquired the company in late 1977. Renamed SERIES IV, the product was marketed both in Europe and the United States by the Software Products Group.(31)

SERIES IV was a generalized data entry/validation system which allowed full interactive data validation on-line. The system could be purchased either as an independent software product or as an integrated hardware software system, including the PDP-11 computers running under either the RSX-11 or IAS operating systems.

SERIES IV could generate programs for all types of validation, from simple field validations to complex relational validations against data from external files, and could be used by nonprogrammers. It had three powerful components: (1) a high level language allowing quick, accurate, interactive definition of data validation requirements; (2) an optimizer transforming application specifications into operational systems; and (3) an interactive data entry system allowing a variable number of terminals to enter and validate data concurrently for a variable number of applications.

Although a few were sold, the product was a failure. Organizations which already had a PDP-11 and might have bought it discovered that the computer was loaded with its current applications workload, and therefore they would have to buy another computer. The high price of a PDP-11 plus $15,000 for the software, compared with the low price of a special purpose, key-entry machine, discouraged potential buyers. After a few years of unsuccessful sales efforts, in 1980 Informatics sold the product to a new company, SOSY S.A., formed by Jeffrey Milton and its original developers.

11.7.7 The INQUIRY IV/IMS Product

INQUIRY IV/IMS is an on-line retrieval and data analysis program designed for use with IBM computer installations using IMS data bases under the IMS/DC teleprocessing monitor. Employing a set of natural English language user-friendly commands, INQUIRY IV/IMS permits its users to interrogate a data base, receive an answer, reduce and analyze the retrieved data. Its primary users are business analysts of medium to small business firms. Informatics acquired the product (then known as Inquiry/IMS) from CGA Computer Associates, Inc. during 1978 for 12 percent of product revenues of the first three years. With 289 IMS installations in 1974 which grew to 2841 sites by 1978 and projections for 4377 in 1982, Informatics recognized a valuable rapidly growing market. Its competition consisted only of a similar product, ASI/INQUIRY, and batch retrieval and reporting products, programming languages and specialty products designed for particular applications. The advantage that INQUIRY IV/IMS offers over these alternatives is that it operates on-line, requires no technical programming knowledge of its users, and can be used on multi-purpose generalized IMS data bases.

Selling for a price of $40,000, INQUIRY/IMS was projected to increase in sales from six installations in 1978 to 60 per year in 1980. Additional installations for a customer sell for $30,000. Revenues were planned to increase from $267,000 in 1978 to $2.974 million by 1982. Although it has achieved reasonable marketing success, in 1982 it produced revenues of $1.7 million and lost $86,000.(32)

11.7.8 The TRANS IV Product

In 1979 Oxford Computer Systems was successfully selling a product called UFO which was an interactive application development system for IBM computers in the CICS environment. In 1979 Informatics had made the decision that the first MARK V release would only operate in an IMS environment, and it desperately needed a product to sell to its customers who used CICS. So it obtained a non-exclusive license from Oxford to market UFO under the name of TRANS IV.

TRANS IV is a solution-oriented system that performs CICS functions for the programmer automatically. CICS functions for screen displays, file definitions, I/O operations for data entry, updates, searches, and inquiries are performed entirely by TRANS IV. No knowledge of CICS techniques, tables, macros, internals or BMS is required to implement applications under TRANS IV. TRANS IV enables programmers to develop a prototype system with the end user sitting alongside at the CRT. Display screens, files, and procedures are developed interactively for end user review and approval. Test files can then be developed using the TRANS IV library. Modifications are made on-line and

redisplayed until no further changes are necessary. The prototype system then becomes the specifications for the production system, and the test files can be converted to a production CICS environment by using a TRANS IV utility program.

Introduced in September 1979 by Software Products Group for a price of $35,000 for the OS version and $25,000 for the DOS version, TRANS IV has had modest success in the marketplace in competition with an improved UFO. In 1982 it achieved revenues of $1.6 million and lost about $400,000.(33)

11.7.9 The TAPS Product

Portability of software from one computer to another has been a long sought goal among all users of computers. Late in 1980 Informatics acquired from Decision Strategy Corporation a product called TAPS which promised to take a long step in the direction of portability. The product was acquired by the Corporate Development Group under Werner Frank, and virtually the entire staff of Decision Strategy Corporation joined Informatics as part of the deal and became the TAPS Division under Michael Parrella, vice president and general manager. Prices for the various versions of TAPS were, for a microcomputer $10,000, for a minicomputer $25,000, for IBM/DOS $30,000, and for IBM/OS $40,000. TAPS-based systems are portable among IBM mainframes (with CICS, TSO, IMS/DC, CMS, or TAPS/CM) and among Digital Equipment, Hewlett-Packard, Perkin-Elmer, Harris, and Prime minicomputers.

TAPS is a transaction-oriented, table-driven application development package that provides standardized functions for the repetitive aspects of developing and maintaining on-line systems. With TAPS a program is always associated with screen processing; thus, the concept of the basic TAPS processing unit is "screens within transactions." TAPS uses filled-in-form entries to provide automation of the repetitive on-line development functions.

TAPS is composed of four components:

(1) The executive component provides the interface with the computer operating system and acts as the transaction operating system for all TAPS processing. The executive component controls sign-on and menu displays, performs security checking, provides facilities for data paging and storage as well as the collection of data from the system, and writes the data to a data collection file.

(2) The TAPS Message Handler (CM) controls the communications network, delivers the raw messages, and maintains the network buffers.

(3) The TAPS Application Manager (AM) is controlled by user-defined tables to perform the functions of transaction scheduling, module scheduling, message mapping, editing, screen format maintenance, and temporary data storage provision.

(4) Operating as an application system under AM, the TAPS Data Manager (DM) automates the data interfaces. Additions,

changes, deletions, and extractions are performed automatically by DM, along with updating of a valued, inverted index structure. Facilities include an English language retrieval system capable of supporting compound logical inquiries and a real-time report writer to display the results.

TAPS is marketed in numerous ways. Many developers of software products use TAPS as an integral part of their development process. Many small computer companies use the version for their computer as one of their standard products which they market. In both cases Informatics receives royalty payments.

There is no question that the market for which TAPS was designed is a huge one. The demand for development of on-line interactive systems is growing rapidly. The accelerating trend to ever lower hardware costs makes the benefits of on-line operation increasingly more attainable, and the burgeoning interest in distributed processing adds further impetus in this direction. When such a product can also offer the benefits of portability across a wide range of computer and communications facilities, including microcomputers, it is worthy of very special attention.

An impressive accomplishment for TAPS is its use by the Department of the Navy. With its worldwide DP using all types of computers, peripherals, and data base management systems that must be tied together by a communications network, the Navy represents perhaps the ultimate test of the effectiveness of a product purporting to minimize setup time while helping to tie these diverse elements together.

At the end of 1982 it was too early to assess whether this product would be a success. In 1982 the TAPS Division recorded revenues of $4.9 million and lost $390,000.(34)

11.8 ACQUIRED APPLICATION PRODUCTS

11.8.1 The ACCOUNTING IV Products

ACCOUNTING IV was a set of accounting application products consisting of general ledger (GL), accounts payable (AP), and accounts receivable (AR) systems. As described in Section 4.2.8, Informatics acquired the general ledger system from Asystance, Inc. during 1973. To make GL attractive, it was necessary to offer a complete product line. The company was unwilling to risk a large development effort, but very few AP and AR products were available. Eventually, in 1975, Informatics purchased AP and AR from Computer Applied Systems Company (CAS), as described in Section 4.2.12. All three products were acquired for a very small investment to gain an entire product line. Both Asystance and CAS were very small companies with only a few employees--the principals being Fred Dilger and Ron Kupferman in Asystance and Jack Freidland and Jack Sparks in CAS.

While at Beaunit, a textile company in North Carolina, Dilger and Kupferman had developed the GL program (written in PL/1), then were given rights to it by their employer and founded Asystance, initially owned by Beaunit. These products were sold to medium-sized businesses with annual revenues of $30-100

million and a minimum of 1,000 general ledger transactions (for GL) or 8,000 accounts receivable transactions (for AR) per month. The products were designed to run on IBM System 370/135 and larger computers. Informatics first task was to convert GL to COBOL. As a result, non-standard custom modified versions of the ACCOUNTING IV products were made available (not without many difficulties) for the Univac 9400, RCA Spectra/70, Honeywell 6000 and 2000 series, Burroughs 4700/6700 and Control Data 3100 computers. These efforts distracted the small development staff from maintaining and enhancing the basic IBM 370 product.

The general ledger system was considered quite comprehensive by Informatics customers and was successfully used internally by Informatics. Its functional capabilities were equal to or better than other such products then available. ACCOUNTING IV/GL could prepare financial statements in conventional format or alternatively in matrix or graphics format with summaries at any level. The reports could compare actual figures to current year plan and prior year actuals on a current month and year-to-date basis. Individual cost center performance was available at any level. Automated cost allocations could be used if the accountant so specified. But in 1973 the general ledger system also did not exist in a form to be used with on-line data bases (which were then being widely adopted) and lacked a generalized report generator capability to create specialized user defined reports and did not permit individual project or divisional processing. Informatics gradually improved GL, issuing new releases each year, and in 1975, for instance, used SCORE (obtained from the acquisition of PMI) to provide the much needed special report generator.

The accounts receivable system was not as comprehensive as competing products but did sell to a number of banks which used it to supply data processing services to their customers. The accounts payable system had many weaknesses, and very few were sold. The glaring deficiency was that AR and AP were not well integrated with GL. In retrospect, it is likely that the company should have gambled on an in-house development of AP and AR. If it had done so, it could have been the first supplier of integrated accounting software.

The individual products sold from $17,500 for the accounts payable product to $28,000 for the general ledger system. There were also several optional special features for the general ledger system such as currency transaction and translation processing and flexible budgeting features which could be purchased for a nominal fee of $3,000 to $4,500 each. A fully loaded general ledger system cost $38,500. The accounts receivable system sold for $25,000. All three ACCOUNTING IV products were sold by a sales team of Informatics Computing Technology Company's Business Systems Division in New Jersey headed by Walter Brown. With the formation of the Software Products Group in 1977, technical development of the product line was transferred to the Software Products Technology Division in Los Angeles directed by Wilson Cooper. Sales were conducted by a unit of Software Products Marketing directed by Ron Kupferman, headquartered in Raleigh, North Carolina, who reported to Stanley Felderman in Los Angeles.

At first, the ACCOUNTING IV products appeared promising to Informatics as revenues increased until 1977. Although the company trailed behind Management Sciences of America (MSA) and one or two other accounting systems suppliers, Informatics projected its accounting product revenues to grow from $362,000 during its first 12 months (1973-1974) to $4.35 million in 1979. During the

same period, operating income was to increase from a loss of $233,000 to $750,000 in profits. Desiring his product line to eventually lead the market, Walter Brown advocated making significant investments in the ACCOUNTING IV products to catch up with and overtake MSA during the five years between 1975 and 1980. But Informatics was willing to invest much less than Brown believed to be necessary.(35)

In an attempt to make his goal a reality and to maximize the resources of his division, Brown ingeniously formulated a "poor-boy" strategy. He concentrated on marketing and kept in-house development and quality assurance costs to a minimum. Improvements incorporated in the ACCOUNTING IV products were "nursed" to market introduction through the tender loving care of a small technical staff, headed by two brilliant programming virtuosos. Rather than being thoroughly tested in-house before being made available for mass release to customers, each new release or enhancement of an ACCOUNTING IV product would be specially field tested and debugged at a couple of specially selected, tolerant customer sites. In fact, the Business Systems Division even provided data processing services using ACCOUNTING IV to two minor customers precisely for this purpose. As errors were detected at the test sites, they would be immediately corrected. When the release appeared to run smoothly with a minimum of errors it would gradually be released to the complete customer base, and finally to new customers. In 1976 Business Systems Division had revenues from the product line of $1.8 million and losses of $117,000 after amortizing $129,000 of previously capitalized costs.

This procedure worked well as long as the ACCOUNTING IV product line stayed with the Business Systems Division which was solely dedicated to it. But in late 1976, as the result of a corporate-wide reorganization described in Section 11.3.3, the Business Systems Division was eliminated and all software products were consolidated under the direction and marketing of the Software Products Group with Paul Wrotenbery as Group Vice President. Walter Brown resigned. At the time of transfer, Release 8 of the ACCOUNTING IV General Ledger System, which included many long needed on-line features, was just completing its development phase. About half of the programmers in Business Systems Division refused to move to Los Angeles and left the company. Unaware of the personalized "quality control" procedures the ACCOUNTING IV products had previously received, the Software Products Technology Division, taking the word of one of the virtuoso programmers, believed the new release had already been sufficiently tested. Under pressure from marketing (who had been selling the much improved Release 8), Wrotenbery decided to ship Release 8 to all existing and new customers. Results were catastrophic. Numerous and frequent errors began occurring at various product installations. Informatics did "fix" these "bugs." But since the technical staff had to be rebuilt in Los Angeles, it was a time-consuming process taking many months to complete. In the meantime, the market reputation of the ACCOUNTING IV product line had been hurt beyond repair and new sales of the product declined.

In the late 1970's accounting application products for minicomputers promised to be a growing market. Informatics hired a group of people in Burlington, New Hampshire, who were skilled in converting mainframe software to minicomputers. ACCOUNTING IV products were converted to run on the IBM Systems 34 and 38. But they never sold. So after several years of losses, Informatics divested itself of the ACCOUNTING IV products in 1981 to Global Software, a new company formed by Dilger and Kupferman.(36)

11.8.2 The PRODUCTION IV Product

As discussed in Section 4.2.7, in May 1972 Informatics entered into an option agreement to purchase licensing rights to software for manufacturing production control developed and marketed in Europe by a small Danish consulting firm known as Parsons and Williams AG (P&W). It had been founded by two professors of industrial management from U.C.L.A. The company was acquired in December 1973. The software product, originally known as IMP and renamed PRODUCTION IV by Informatics, was an entire product line for production control, shop scheduling and inventory management, primarily for discrete manufacturing. These could be run separately or interfaced as modules into one comprehensive integrated production management system.

The product line consisted of nine basic modules or subsystems for the functions of Master Scheduling, Resource Planning, Manufacturing Data Control, Capacity Allocation, Material Planning, Inventory Management, Purchasing, Shop Scheduling and Control, and Cost Control. Each of these modules could be purchased separately with prices from $10,000 to $62,0000 each. Initially, the entire system (consisting of only the five modules which were useable in 1973) was offered by Informatics at a discounted rate of $40,000. A number of optional special features were also offered with price tags from $1,000 to $6,000. Informatics sold PRODUCTION IV as a software product. Additionally, management consulting, installation services, customization of the programs to meet the customer's unique needs, user training and education, and formal systems support and maintenance were sold on a T&M basis. Designed for use with IBM System/360 model 40 and larger computers, it was a very large, integrated, comprehensive application product.

Informatics relocated to Los Angeles most of the technical staff of Parsons and Williams headed by Ole Nord and Harald Josefson and formed a new Industrial Systems Department (later Division) (ISD) within Informatics Western Systems Division (later Company) under Wilson Cooper to sell, service and improve the product. An industrial management expert, Dr. Michael Lodato, was appointed vice president/general manager of ISD, and he immediately plunged ahead to make PRODUCTION IV known among the American manufacturing community. He joined the Los Angeles chapter of the Association for Production and Inventory Control Systems (APICS) and was elected as its vice president of Education and Research and a member of its Board of Directors. He was also quickly appointed as the program chair for two manufacturing systems conferences: "Return On Investment in Production and Inventory Control" sponsored by the Los Angeles APICS chapter in November 1972 and the joint U.C.L.A./Informatics symposium on "Integrated Manufacturing Management Systems" held in March 1973. In both conferences PRODUCTION IV was introduced and Lodato and Professor Williams (founder of P&W) played prominent roles. Informatics also hired Dr. Neal M. Burns (formerly marketing director for Honeywell Systems and Research Division and former President of Napco Industries) as a marketing consultant to "advise on marketing strategy and penetration tactics, participate in prospect calls, and to set up initial calls in the midwest."

After intensive investigation and analysis, revenue growth for PRODUCTION IV was originally projected to grow from $30,000 in 1973 to $3.63 million in annual sales by 1977. Pretax profits were to increase in the same period from a loss

of $120,000 to $820,000 in earnings. The company viewed the market potential for PRODUCTION IV to be promising:

> Production IV appears to be the most complete and powerful set of manufacturing software commercially available [with] significant market opportunities.
>
> Over 525 manufacturing establishments currently fit the PRODUCTION IV "profile" ("immediate market").
>
> Over 2000 fit the "marginal profile" ("upgrade market")
>
> Over 2500 qualify as prospects through service bureaus ("computing services market")
>
> The interest and requirement for manufacturing software is accelerating rapidly. The operating results of companies who have successfully installed such systems have been dramatic. As the number of these successes increases other companies will have to follow suit in order to survive.

The "immediate market" potential customers were seen as companies operating in the ordnance, automotive, fabricated metal, non-electrical and electrical machinery, transportation equipment, professional/scientific control instrumentation and other discrete manufacturing industries with annual sales of at least $75 million or 1,000 employees.

Competition to PRODUCTION IV was seen as "insignificant," as indeed it was--in 1973. Competing software products consisted of IBM's PICS and COPICS systems (which at that time were not programs, but manuals on how to write a custom program), and a few smaller but much less capable application products. At the end of its first two years of sales of the product, the company hoped to achieve an objective of penetrating one percent of its identified immediate market.(37)

ISD succeeded in selling several PRODUCTION IV systems in the U.S. Customers included Beloit Corporation, Sundstrand Corporation, several divisions of Food Machinery Corporation (FMC), a division of General Motors, Gospel Publishing Company, Purolator, Anchor Darling, Rock Island Arsenal, and Lockwood Farm Equipment. Several new installations were made in Europe, mostly in the Netherlands. SEMA was given marketing rights in France, but never made any progress.

According to Frank Wagner, Informatics may have entered this market seven years too early. Despite the complete integration and comprehensiveness of PRODUCTION IV and Lodato's efforts to educate industry about it, the market grew too slowly to finance improvements and updates which were determined to be needed if the product was to be viable throughout the 1970's and into the 1980's. No significant sales were made by any competitor until after 1980. Since PRODUCTION IV had been originally designed in 1963, it was based upon use of DBOMP data files. DBOMP systems were becoming obsolete (they could not support on-line inquiry) and gradually being replaced by more sophisticated data management systems during the 1970's. Another negative was that PRODUCTION IV did not have a "net change" feature, which was promoted by Ollie Wight, a

respected consultant, as an absolute requirement. According to Robert Heckathorne, who spent two years on the technical staff of PRODUCTION IV, the product was too complex and could not be sold as a standard system. It had to be modified and adapted to the customer's needs by Informatics. It was soon recognized that by the time the manufacturing industry grew into a mature market the product line itself would be obsolete and would require a large investment to do over. In 1976 ISD had revenues of $638,000 and losses of $125,000 after amortizing $133,000 of previously capitalized costs.

The Industrial Systems Division was transferred into the Industry Aplications Group, under Paul Wrotenbery in 1975, and became part of the expanded Software Products Group in late 1976 as the Manufacturing Systems Division (MSD). Due to various reasons--low sales, lack of visibility of the rate of development of the marketplace, additional requirements for technical development, and the need for prolonged customer support--Informatics decided to alter its strategy for the manufacturing market in 1977 by discontinuing sales of PRODUCTION IV as a standard software product. Under the direction of Paul Wrotenbery, the MSD was transformed from a software products sales and development activity to a specialized consulting and custom software services operation. Sometimes PRODUCTION IV software was sold "as is." Previous PRODUCTION IV customers were still supported with field service and maintenance. A small operation of six to ten people directed by Harald Josefson and headquartered in Des Plaines, Illinois, it has, on a time and materials basis, revised the data base and developed some on-line components to PRODUCTION IV. It has been earning a small but steadily growing amount of revenues since its re-orientation. In 1982 MSD recorded revenues of $702,000 and profits of $203,000, the highest percentage of profit to revenue of any Informatics unit.(38)

11.8.3 The Composition System Products (CS IV and CS V)

As discussed in Sections 4.3.2 and 7.5.2, in 1973 Informatics investigated acquiring a small company called Autocomp, which had developed an excellent computer program for the IBM 370 called RECOMP to automate the composing of material for printing. It accepted text as input, into which were imbedded symbols which described what a printed page should look like (the type font, size and spacing of characters and lines, headings, indentations, footnotes, etc.). The program then produced a magnetic tape which would drive an electronic photocomposition machine to produce a complete page of text, ready to be photographed and converted into a plate for offset printing. This was a major advance over the old fashioned methods of composing used by the printing trades, using "hot-lead" Linotype machines. Autocomp's financial difficulties prevented the acquisition. But, before Autocomp went out of business, Informatics acquired from it, for a modest sum, a perpetual exclusive license to use and re-sell RECOMP. For practical purposes this was the same thing as acquiring the software outright. Informatics renamed the product Composition System IV (CS IV) and it formed the basis for the growth of the Publishing Services Division (PSD).

Through the 1970's Informatics continued to enhance and improve CS IV, until it became the most versatile and sophisticated computer program for this purpose available in the world. It can perform an incredibly large number of functions, many of which can be understood only by printing technologists. Just as an

example, it can compose mathematical equations and chemical structure diagrams; it can set fixed heads and up to five levels of continuation heads; it can set up to 44 tabular columns justified vertically and horizontally; footnotes are set automatically with their structure independent of the text, etc. The output tape produced can have a format suitable for virtually any optical or electronic photocomposition machine.

Eventually, PSD offered it for sale as a software product. However, it recognized that the market was very limited, consisting of printers who had ready access to an IBM 370 computer and a modern photocomposition machine. A few prospects were found among large corporations which had an in-house printing operation, but the potential marketplace was not large enough to justify investment in a dedicated sales force large enough to make its revenues significant. Only one or two were sold or leased. In about 1980, however, Informatics OEM relationship with Wang Laboratories, Inc. suggested another way to exploit CS IV. It was converted to run on the inexpensive but powerful Wang VS computers, supporting 8 to 128 workstations for keying input. It was further enhanced by prepackaging five standard Composition Specifications and adding additional functions such as Automatic Indexing, Table of Contents, and Pagination, including Folio Assignment and Point-Page Numbering. It was named CS V and offered for sale as a complete integrated product, including the Wang hardware. It received a good reception in the marketplace, and by the end of 1982 two systems had been sold and there were many good prospects. Plans were being made for the development of a new product to be called InfoPage, which would include as well a directly interfaced phototypesetter for a packaged price expected to be about $175,000.(39)

11.8.4 Corporate Shareholder System (CSS)

When Informatics acquired PMI as described in Section 4.2.13, it acquired a license to sell an application product, the Corporate Shareholder System (CSS). The product was owned by the Trust Company of Georgia and maintained by its original developer. It turned out to be highly successful. CSS is used to maintain shareholder records by banks which perform the function of registar and/or transfer agent for corporations with public shareholders. It is also used by the data processing departments of those corporations which perform these functions themselves.

CSS is a fully automated system which provides complete control of all stockholder accounting functions. CSS had been installed by more than 100 banks and corporations and is used to process the stockholder records of more than 2,000 major companies. CSS permits either batch processing or on-line editing, updating, and necessary backup processing associated with both transfer generated activity for both "book, non-book" issues and file change activity. Name and address records, certificate detail information and additional descriptive codes are maintained and are available to permit various forms of management reports and statistical analyses. Users are able to respond quickly and with accuracy to questions, inquiries, and instructions from management. Dividend processing, including dividend reinvestment with full accounting for both "fee, non-fee," "open market purchase--treasury issuance" with dual or discount pricing plans, can be performed. Stock splits and stock dividends, on either a fixed or variable price basis, are handled automatically, producing cash-in-lieu-of checks, buy/sell option card, or fractional share certificates.

Proxy production and tabulation, either cards or on OCR forms, is performed with an absolute minimum of effort. Historical data is organized in such a manner as to minimize the time required to service an inquiry, and to minimize the number of clerical employees required to control the system. All federal and state tax reporting requirements are met, including the production of magnetic tapes for the IRS. Available options permit combined issue accounting, automatic certificate production, and a large variety of more customized features. Recent enhancements to CSS include: Employee Stock Option Plan (ESOP) and Tax Reform Act Stock Option Plan (TRASOP) accounting; Lost Shareholder/Escheatment, a Rights Offering Module, and a Generalized Report Generator. Turnkey conversion services can be provided.

It was sold by a very small unit, initially in Software Products Group, reporting to James Porter, where it produced very strong profits, and later in Commercial Information Systems, reporting to Spec Bradley. In 1982 the Corporate Shareholder System produced revenues of $2.3 million and profits of $880,000. But there was a cloud hanging over this business. The marketing agreements with both the owner and the developer were due to expire in a few years, and there was no assurance that they could be renewed on terms that could permit profitability for Informatics.(40)

11.8.5 Law Office Management Products

As described in Section 4.2.19, in 1981 Informatics acquired all the assets of Professional Software Systems, Inc. (PSS), a Phoenix-based supplier of proprietary software and minicomputer turnkey systems for law office management services. As discussed in Section 7.7.2, this was the outgrowth of the great success of the Legal Information Services Division (LISD). After the acquisition PSS became the PSS Division of Informatics (PSSD) and the two formed the Legal Information Services Operation (LISO) under John Rome. At the time of the acquisition PSS systems had been installed in 75 major law firms in the U.S. The original management did not remain. In 1981 Roger Philips became vice president and general manager.

A modern law office uses one information system to handle all key law firm functions--timekeeping, billing, accounting, word processing, filing, and electronic mail. It uses the same system to monitor office performance, track attorney appointments, and determine possible conflict of interest, thereby realizing measurable increases in productivity and profitability. PSSD offers for sale an integrated turnkey product, including both the software and the hardware running on Wang VS computers. It does this under an OEM agreement with Wang whereby it buys the computers at a large discount in order to resell them at list price. The system consists of a number of products:

- Legal Time Management System (LTMS), which keeps track of the time spent by each attorney, paralegal, and secretary, produces bills for the customer, and performs the accounts receivable function.

- Payroll provides complete payroll accounting that meets all federal, state, and local requirements.

- Accounts Payable features checkwriting, invoice posting, and automatic distribution to accounts in the general ledger.

General Ledger receives entries from LTMS, Payroll and Accounts Payable, maintains the general ledger and produces financial reports.

Docket is a computerized calendar to keep track of each attorney's appointments.

Adverse Party provides for on-line search capabilities to check names of possible clients and related parties for conflicts of interest.

TEXTRACT provides user-friendly capabilities to manage the storage and retrieval of large volumes of documents, to automate the management and cataloging of, for example, attorney work products, law libraries, wills and trusts, and litigation documents.

Management Report Facilities permits the extraction, without special programming knowledge, of user defined data from existing LTMS files to new summarized files.

Word Processing Enhancements expands the Wang word processing program with functions specifically added to meet the unique needs of law offices, such as automatic footnoting, automatic repagination, generation of table of authorities, table of contents and automatic paragraph numbering.

Another software product for use by the legal profession is the BASIS system. Developed by Battelle Memorial Institute, it is licensed to Informatics for resale to the legal industry as part of an integrated system on Wang VS computers. It is equivalent to a smaller version of the RECON IV system for IBM mainframes described in Section 11.7.1 above. Thus Informatics offers, for this purpose, three levels of capability and price, with RECON IV being the highest level (for IBM mainframes), BASIS the intermediate level (for Wang VS systems), and TEXTRACT the lowest level (for both IBM and Wang systems).

When acquired, PSSD had annual revenues of about $5 million. In 1982 these revenues had grown to $9.1 million, with profits of $164,000, after writing off $274,000 of acquisition costs.(41)

11.8.6 Accounting Office Products

As described in Section 4.2.21, in 1981 Informatics acquired Mangement Control Systems, Inc., (MCS) based in Atlanta, Georgia. It was founded by Richard T. Brock in 1975. He remained as vice president and general manager. Software developed by MCS for IBM System 34 and System 23 computers was sold to regional Certified Public Accounting (CPA) firms through a nationwide sales force consisting of direct sales representatives and specialists in telephone and direct mail. At the time of acquisition the customer base totalled almost 1,000.

MCS software for CPA firms is of two types. Practice Management provides the management of the firm with all the tools necessary to control the

operations of the firm and produce profits. It keeps track of clients and the employees assigned to them, client billing, accounts receivable, unbilled fees, and profitability. In addition there is a staff scheduling program and one to monitor the due date of various commitments. To assist in auditing practice there is a program to generate random numbers for sampling of, for example, accounts receivable.

The other type of software provided to CPAs is that which the CPA uses to perform financial accounting and reporting for his client. Consequently, it includes general and subsidiary ledger products, accounts receivable and payable products, a payroll system, and several tax preparation programs. All of these ran initially on the IBM System 34 and System 23. They have since been converted to run on the System 38 and the IBM Personal Computer.

Upon acquisition MCS reported to James Porter in the corporate office. In 1982 it recorded gross revenues of $7.7 million and profits of $316,000, after writing off acquisition costs of $583,000.(42)

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