PRODUCT EVALUATION REPORT
DYLAKOR, INC.

Prepared for: Sterling Software, Inc.
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Date: March 16, 1983

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Report Summary

Burton Grad Associates, Inc. (BGAI) has completed an
evaluation of the two software products which Sterling
Software, Inc. has obtained as part of their acquisition
of Dylakor, Inc. of Granada Hills, CA:

DYL 260/280 - a report writer and extended utility system
DYLAUDIT - an audit-support package.

The procedures followed, and the results of this analysis,
are documented in this report and its appendices. Based
on using the profit projection methodology, the conclus-
ion is that these products have the following capitaliz-
able asset values:

Product	Expected Value
DYL 260/280 - U.S.	$5,458,000
DYLAUDIT	1,699,000
DYL 260/280 - International	1,332,000
	$8,489,000

Based on an analysis of the expected revenue for each
of these software products, BGAI has concluded that
significant profits can be achieved over a ten year
product revenue life.

SECTION I - OBJECTIVES

Sterling Software, Inc. has acquired Dylakor, Inc., a computer
product company located in Granada Hills, California. As part
of the assets, Sterling has obtained the software products which
they wish to have accurately evaluated so that they can be cap-
italized. There are a number of individual products involved,
each of which needs to be separately evaluated.

Burton Grad Associates, Inc. (BGAI) has been requested to use
its previous experience in such evaluations, plus its knowledge
of similar computer software products to prepare a report estab-
lishing an expected present value and expected revenue and profit
period for each of the Dylakor products.

SECTION II - DESCRIPTION OF PRODUCTS

A. The Company

Dylakor was founded in September 1968 by Jim Case and Bill
Newcomer. Their initial intent was to build a firm that
would provide a broad range of computer services, including
consulting and software products. The company's philosophy
was built upon Bill Newcomer's service bureau background and
personal expertise in developing good system-user interfaces.

The following table summarizes Dylakor's past sales perform-
ance:

Year	Sales Revenue ($M)
1978	1.5
1979	1.9
1980	2.3
1981	2.7
1982	3.6

A budget of 4.3 million dollars has been approved for 1983.

Dylakor's headquarters are in Granada Hills, California. In
September 1982 the firm opened an office in Atlanta, Georgia
on a trial basis. In addition, several individuals act as
distributors outside the United States, notably in Japan,
Israel and Brazil.

B. DYL 260/280

DYL 280 - like its predecessor, DYL 260 - is a comprehensive
report writer and extended utility product. As such, it is
designed to generate reports using data available within a
corporation. The reports are produced with substantially
less effort than would be required to write a conventional
program to perform the same function. Furthermore, DYL 280
can be used by programming or other data processing staff to
copy or print all or selected portions of data files for back-
up, recovery or "debugging" purposes.

The first product of the company was a utility program (DYL
250) that made it easier for users to massage and transfer
data between different storage media. Sales were apparently
disappointing until a fundamentally new marketing and installa-
tion strategy was introduced in 1971. User installation was
simplified; at the same time, Dylakor introduced a direct mail
marketing program through which they would "give away" the
software, but charge $1.00 per day to cover maintenance avail-
ability. The market reacted positively to this approach, and
there were over 475 installations by March 1972.

DYL 260 was started in 1971 and successfully tested at a cus-
tomer site in late 1972. It further facilitated use by non-
technicians -- adding default formats that provided for auto-
matic composition of requests, and a "centerfold" in the doc-
umentation to guide the use of the system. Since its intro-
duction, DYL 260 has been enhanced in two ways: (1) multiple
report capabilities were added; and (2) the compiler was op-
timized to permit users to develop larger programs. No new
releases are currently scheduled. It has over 1,000 current
users.

DYL 280 was created as an enhanced version of DYL 260. It
has been significantly improved since its introduction: (1)
multiple report capabilities were added; (2) coded transla-
tion features were added; (3) edit capabilities have made it
possible for users to define flexible screening criteria;
and (4) access has been provided to major library systems.
A new release is scheduled for March 1983, which will con-
tain cross references of data names, additional user format
options, and it will provide users with the ability to use
structured code. DYL 280 has over 1,000 users, most of whom
also use DYL 260.

For product evaluation purposes, DYL 260 and DYL 280 have been
considered as a single product, since it is the apparent in-
tention of Dylakor to replace the former by the latter.

SECTION III - EVALUATION PLAN

A. Consultants

Burton Grad, Chairman and Chief Executive Officer of
Burton Grad Associates, Inc., has been providing strategic
planning and new business consulting to software products
companies during the past four years after his eighteen
years as IBM's Director of Development for software products.
He was responsible for organizing the procedures to be followed
in this study and for establishing the criteria to be used. He
was also responsible for estimating the useful life and the
marketability of all the products. Finally, he integrated the
study and report. His biography is in Appendix A-1.

Myron Uretsky, a CPA and Professor at New York University, has
been used to estimate market potential, and to establish cost
of money, net present value methodology, tax handling of de-
preciation and general review of product revenue and operations
cost determination procedures. His biography is included as
Appendix A-2.

C. DYLAUDIT

DYLAUDIT is a front-end product that includes either DYL 260 or DYL 280. It is designed to be used by auditors.

DYLAUDIT provides standard auditing functions such as listing and sampling data files. It also produces confirmation letters that include some addresses and values from files.

The product was introduced in February 1979 and was upgraded to provide free form access in September 1981. A new release is scheduled for April 1983. It will contain provision for linear regression, trend lines, scatter diagrams, and enhanced letter writing capabilities. There are currently more than 100 users of this product.

B. Selection of Evaluation Methodology

A variety of asset appraisal techniques were considered, including actual construction cost, acquisition cost for comparable products, reconstruction costs and capitalization of the projected profit stream. A short description of each of these is found in Appendix B.

- There is insufficient detailed data relating to development of individual products to produce a satisfactory analysis of actual construction costs.

- Comparable acquisition cost for these products is difficult to measure since there are no direct analogies with other products acquired within the past year working under similar operating systems and equipment.

- Reconstruction cost would theoretically be used, but it would not be the preferred approach, since the method does not take into account the value of the large customer base - a significant asset in this case.

- Capitalization of the projected profit stream appears to be the most reasonable methodology. The key products have been established in the marketplace long enough for there to be sufficient logic to prepare the sales forecasts and cost estimates which are required.

We have chosen to use the capitalization of the projected profit stream methodology. DYL 260/280 and DYLAUDIT have been evaluated separately; in the DYL 260/280 case, the different marketing approaches for the domestic and the international markets have been translated, in turn, into two separate profit streams.

SECTION IV. PROCEDURES AND RESULTS

There are five primary steps in determining the net
present value of the projected profit to be earned by
each of the products:

(A)   Establish the available market opportunity

(B)   Prepare product unit forecasts

(C)   Estimate revenues

(D)   Estimate operating costs and calculate pre-
       tax profits

(E)   Compute net present value with adjustment for
       tax liability.

A.   Available Market Potential

The Dylakor product line is provided to customers using IBM
360/370, 30xx, 43xx systems operating under DOS, OS, or VM/CMS.
All forecasts show that this market is in excess of 20,000 units
installed and any reasonable projection of DYL 260/280
sales relate to a very small segment of this market (less
than 10 percent). Hence, total market size is not a limiting
factor.

DYLAUDIT is marketed to CPA firms whose clients are operat-
ing in the above stated systems environments. There are
thus two limiting factors: (a) clients' operating environ-
ment and (b) CPA computer sophistication. In the former case,
the comments made in the previous paragraph are applicable.
There are no reasonable estimates of computer sophistication
in CPA firms. If one excludes accounting establishments with
nine or less employees, there is a market potential of over
15,000. This number is not expected to change significantly
in the next six years.

Dylakor has not addressed the international market, concen-
trating on developing a solid domestic customer base. At
this point in time, the biggest risk in entering the inter-
national arena relates to the product's underlying technology
(ten years old) and the strength of the competition. All
the major competitors have extensive international operations
in place and high market share. Thus, the market opportunity
appears restricted to new IBM mainframe installations, since
most current ones are already using a competitive package.

IV-1

B. Product Unit Forecasts

The domestic unit sales forecasts for DYL 260/280 and DYL
AUDIT were based on historic sales experience for each prod-
uct modified by current industry and competitive knowledge.
The international DYL 260/280 forecast was generated based
on expectations of market development through a mixture of
joint ventures and agent contracts. The assumptions and
individual forecasts are included in Appendices C and D.
Their summary is shown below:

	1983	1984	1985	1986	1987	1988	1989
DYL 260/280 - U.S. (Installed Effective Units)	1380	1567	1690	1739	1669	1499	1263
DYLAUDIT - U.S. (Installed Effective Units)	174	236	284	316	320	300	263
DYL 260/280 - International (New Sales)	49	252	336	444	444	355	249

C. Revenue Estimates

Conversion of product unit forecasts to revenue depends on the product pricing structure (see Appendix E)

In the United States, both DYL 260/280 and DYLAUDIT are sold on an annual lease basis. We have used a weighted average sales price per unit of $1,830 for DYL 260/280 and $3,200 for DYL AUDIT.

Internationally, a final sales price of $11,000 per unit was assumed; Dylakor's revenue is estimated at 30 percent of this amount, or $3,300 per unit.

Given the size of the installed customer base in the domestic market for both DYL 260/280 and for DYL AUDIT, it is clear that there would be considerable future revenues and profits from continued usage. This is especially true for those installations first made during 1987-1989 (remember that 60% of these installations are made on a 2 year or 3 year lease basis.)

We have, therefore, assumed that Dylakor would offer to all licensees as of January 1, 1990 a "paid-up" perpetual usage agreement with 3 years of maintenance for two-thirds of the normal 5 year price. We believe that 75% of all installations would accept this offer and pay for this license in 1990. The remainder would drop the license.

The revenue forecast is thus the following:

(K$)	1983	1984	1985	1986	1987	1988	1989	1990
DYL 260/280 - U. S.	2525	2868	3093	3182	3054	2743	2311	5083
DYL AUDIT U. S.	557	755	909	1011	1024	960	842	1888
DYL 260/280 Internat'l	162	832	1109	1465	1465	1171	822	-
Total	3244	4455	5111	5658	5543	4874	3975	6971

D. <u>Operating Costs and Pre-Tax Profits</u>

The next step is to determine the operating costs needed
to support the projected revenues. For the United States we
have assumed decreasing pre-tax profit percentages in three
periods (see Appendix F for current pre-tax profit):

      38.5 percent for 1983-84
      35   percent for 1985-87
      30   percent for 1988-89

and a flat 30 percent for the international sales. Thus,

(K $)	1983	1984	1985	1986	1987	1988	1989	1990	Total
DYL 260/280 U. S.	972	1104	1082	1113	1069	823	693	1525	8381
DYLAUDIT U. S.	214	291	318	354	358	288	253	566	2642
DYL 260/280 Internat'l	49	250	333	439	439	351	247	-	2108
Total	1235	1645	1733	1906	1866	1462	1193	2091	13131

For the special 1990 perpetual license we will assume
also a 30% pre-tax operating profit since the maintenance
will only be required for three years.

E.   Net Present Value

The final step is to compute the net present value of the
profit stream for each product. One can debate endlessly
the correct figure to use for cost of money: operating cost,
current prime rate, projected prime rate, current earnings
percentage, etc. Nevertheless, for conservatism we have assumed
a pre-tax rate of 12 percent and an after-tax rate of 6 per-
cent. All calculations are based on the use of a 6 percent
after tax cost of money adjusted to the investment being made
at the mid-point of each year.

Life expectancy for each product was analyzed and based on
experience to date, product currency, competitive position and
market expectations, we believe that there will be an
effective profit stream at least through 1992; however, for
simplification, we have chosen to treat the 1991, 1992 and
following years as though the income was received (at a
discounted level) in 1990.

The calculation for each product by year is shown in
Appendix G. Each computation took into consideration a
proportional share of the $7,636 K tax asset value which
will be amortized over the statutory five year life.

The following table shows the present value for each product:

(K $)	1983	1984	1985	1986	1987	1988	1989	1990	TOTAL
DYL 260/280 U. S.	946	954	889	852	787	299	238	493	5458
DYLAUDIT U. S.	254	274	271	270	256	104	87	183	1699
DYL 260/280 Internat'l	143	227	251	280	219	128	84		1332
TOTAL	1343	1455	1411	1402	1262	531	409	676	8489

We believe that these results are a realistic estimate of the ex-
pected present value of the Dylakor products.

PROFESSIONAL SUMMARY -- BURTON GRAD

Burton Grad, President of Burton Grad Associates, Inc., has a
long record of significant contributions to data processing. He
has experience as user and developer of application systems and
as author, speaker, innovator, businessman and industry leader
in the computer software and services industry.

*   four years as private consultant for software products,
     software professional services, information processing
     and computer equipment businesses

     --strategic planning, management consulting and
       product analysis and review

     --assisting executives to plan more effectively and
       manage their current and long-range activities

     --work performed individually or with assistance of
       internationally-known specialists in market research,
       graphics, mini and micro applications and computer
       programming

     --list of clients (partial):

               Advanced Computer Techniques
               AGS Computers, Inc.
               Argonaut Information Systems
               Atlantic Management Systems, Inc.
               Boole and Babbage
               CGA Computer Associates, Inc.
               Honeywell Information Systems, Inc.
               Informatics
               Information Science
               IBM
               International Computer Programs
               National CSS
               Northern Telecom
               Software a. g.
               Software Design Associates
               Syncsort
               University Computing Co.

* eighteen years with International Business Machines:

    -- defined, designed and implemented application develop-
    ment systems strategy resulting in release of IBM's
    development management system

    -- development of application programs for every major
    industry

    -- establishment of joint planning and program development
    with European operations

    -- announcement, development and initial support of CICS

    -- management of application development for small business
    and process control systems

    -- responsibility for the production, release, and maintenance
    of close to 200 programs

    -- conception of approach to and programs for text processing
    office automation systems

    -- expansion of computer assisted instruction systems

    -- development of management science and scientific
    programs

    -- participation in the structuring and unbundling of IBM
    program products

    -- creation of the Study Organization Plan for specifying
    and designing application systems

* eleven years with General Electric Company:

    -- programming of the first commercial computer

    -- development of discrete simulation techniques for
    manufacturing planning and control

    -- invention of decision tables

    -- study of automatic factory design

    -- initiation and use of advanced techniques for production,
    inventory and quality control

* over twenty-five years communicating the principles and
  concepts of information processing systems:

  -- co-author of Management Systems, published in 1968
     and republished in 1979 by Holt, Rinehart and Winston,
     used in many colleges to train industrial engineers
     and business management students. The book has been
     translated into Japanese and Spanish.

  -- President of Software Industries Association

  -- board member of ADAPSO, the computer services trade
     association; active participant in Industry Relations
     Committee

  -- early member of CODASYL standards committee which
     defined DETAB-X

  -- speaker at various conferences and contributor to
     professional and trade journals on information process
     charting, study organization plan, automated design
     and manufacturing engineering, decision tables, profes-
     sionalism in systems engineering and educational use
     of computers

  -- Graduate of Rensselaer Polytechnic Institute with a
     degree in Management Engineering

  -- ICCP Certificate holder

Myron Uretsky

Dr. Uretsky is Director of the Management Decision Laboratory at New York University's Graduate School of Business Administration. In this position, he leads one of the most innovative educational organizations in the U.S. -- an organization that works closely with the business community to move students from an academic orientation to a successful business framework. He brings a unique background to this position. Originally trained as a CPA at the City College of New York, his Ph.D. at Ohio State, in 1965, produced the first book dealing with audits of real-time computer systems. Since that time, he has continued his active academic and consulting involvement with both training and new technology.

Dr. Uretsky is at the forefront on developing and implementing training programs. He developed and built the business-oriented computer science programs at the University of Illinois, Columbia and New York Universities. He is a well known developer and user of management games. At New York University, he has pioneered in building management games that use the business community to provide students with concentrated business experience. The success of this program has been well documented, and graduates are now occupying leading managerial positions in government and industry. Just as significantly, enrollment in these programs has quadrupled without any related increase in operating costs.

At the request of the U.S. Department of State, National Science and Ford Foundations, Dr. Uretsky has lectured and developed similar programs in other countries. He has organized teams that have worked in Columbia, France, Hungary, Israel, Netherlands, Poland, Romania and Turkey. He recently led a team that studied US and Soviet negotiating practices.

Dr. Uretsky has worked closely with major organizations, evaluating new technology, developing market plans, preparing business justifications, guiding market entry, and producing market support programs. He carried out a study evaluating the impact of East-West trade on U.S. corporate strategy. He has been actively involved in guiding the introduction of videodisc technology, personal computers and other computer-related products.

DEFINITIONS OF ASSET APPRAISAL TECHNIQUES

1. Actual construction cost

   This recognizes the actual cost of building the
   program, including labor, computer time, support
   costs and an appropriate allocation of management
   and administrative charges. This does not, however,
   recognize intrinsic market value arising from
   the copyright and/or trade secret protection,
   nor the impact of inflation if the actual con-
   struction took place at some period prior to
   the present.

2. Acquisition Cost

   This approach considers valuation patterns for
   previous sales of products or companies where the
   primary assets were similar to those being acquired.
   These patterns would include price/earnings ratios,
   projected earnings streams and the intrinsic
   uniqueness and value of the particular products.

3. Reconstruction Cost

   This calculates the cost that an arms length
   "third party" would incur to build a current
   version of the same product. This of course takes
   the innovation factor into account and recog-
   nizes program elements that are neither in the public
   domain or generally known to the development community.
   All the elements of design, implementation, docu-
   mentation, testing, etc. must be taken into
   consideration, together with the appropriate
   management and administrative allocations. Profit
   margins would not be included.

4. Capitalization of the projected profit stream

   This projects the pretax earnings stream for a
   product over a reasonable useful life and then
   establishes an appropriate present value for
   that future earnings stream. It is based upon
   sales forecasts for the product and the cost for
   maintaining and selling it, as well as overhead
   allocations. It also takes into account the
   time value of money.

DYL 260/280 and DYL AUDIT Unit and
Revenue Forecast - U. S. Market

- Assumptions

    ° The total installed DYL 260/280 units at the
      beginning of each year in the 1980-82 period were
      (based on data provided by the company):

	1980	1981	1982
DYL 260/280	939	1020	1136

    ° 95 percent of the installed base renewed the lease
      the following year. Thus,

	1980	1981	1982
Installed B.O.Y.	939	1020	1136
Renewals	892	969	1079
New Sales	128	167	205
Losses	47	51	57

- Procedures

    ° The renewal rate for each year was forecasted
      as:

      - 95 percent for 1983-84
      - 90 percent for 1985-86
      - 80 percent for 1987-88
      - 70 percent for 1989 - future

    ° The volume in new sales was forecasted as:

      125 percent in 1983 (over 1982 sales)
      100 percent in 1984 (equal to 1983 sales)
       90 percent in 1985 and 1986 of the 1984 and 1985 sales
       85 percent in 1987 and 1988 of the 1986 and 1987 sales
      - 80percent in 1989 of the 1988 sales

These assumptions yield the number of renewals, new sales,
losses and installed base at the beginning of each year. For
revenue calculation purposes, an "effective unit" measure
was also developed, as the sum of the renewals and the aver-
age between new sales and losses because each were in use
for one-half year.

A similar logic was used to forecast DYLAUDIT unit sales, based on the following past performance (as supplied by Dylakor):

	1980	1981	1982
DYLAUDIT INSTALLED UNITS B.O.Y.	21	61	92

The following tables summarize the above assumptions and calculations for DYL 260/280 and DYLAUDIT:

DYL 260/280

	1983	1984	1985	1986	1987	1988	1989	1990
Installed B.O.Y.	1284	1476	1658	1722	1757	1582	1416	1111
New Sales	256	256	230	207	176	150	120	
Renewals	1220	1402	1492	1550	1406	1266	991	
Losses	64	74	166	172	351	316	425	
Effective Units	1380	1567	1690	1739	1669	1499	1263	

DYLAUDIT

	1983	1984	1985	1986	1987	1988	1989	1990
Installed B.O.Y.	143	206	266	302	329	311	290	236
New Sales	70	70	63	57	48	41	33	
Renewals	136	196	239	272	263	249	203	
Losses	7	10	27	30	66	62	87	
Effective Units	174	236	284	316	320	300	263	

DYL 260/280 Unit Forecast -
International Market

Assumptions

° Active negotiations to procure agents yield first
contracts in first quarter of 1983.

° New sales break down as follows:

1983	1984	1985	1986	1987	1988	1989
49	252	336	444	444	355	249

Pricing Policies

In the domestic market, Dylakor offers its two products on a lease basis, terms ranging from one to three years. The prices and percentages of the customer base under each lease are:

	One Year Lease	Two Year Lease	Three Year Lease
DYL 260/280 price	$ 1,968	$ 1,848	$ 1,620
DYLAUDIT	$ 1,464	$ 1,368	$ 1,272
Percent of Customers	40%	20%	40%

We have assumed, therefore, a weighted average price for DYL 260/280 of $1,829 (approximated to $1,830) and of $1,368 for DYLAUDIT. Since all DYLAUDIT customers are users of DYL 260/280 as well, the price of DYLAUDIT has been taken as the sum of the two, or approximately $3,200 to account for the double product usage.

The projected revenue figures are based on 1982 dollars without any increase to recognize inflation.

The international selling price has been assumed to be $11,000, representing a 4-1/2 year lease (including maintenance). No customers were assumed to renew the lease. Dylakor is to receive 30 percent of the selling price, or $3,300 per unit sold.

Operating Costs

Operating costs can be treated as a function of revenues over the seven year forecast period, since all of the relevant costs vary directly with changes in revenue volume.

Dylakor's revenue and cost figures for the period 1980-82 are (as per Arthur Young & Co.):

	1980	1981	1982
Revenue (000's)	2353	2648	3517
Cost of revenue (1)	600	913	1371
Selling, G& A (2)	720	859	905

   (1)   Includes educational services, seminars, supplies, cost of keeping products current.

   (2)   Includes sales salaries, advertising, newsletters, telephone and hot-line.

These figures result in average operating costs of:

Cost of Revenue	31 percent
Sales, G & A	29.5 percent
Total	61.5 percent

This yields a current pre-tax profit of 38.5%.

Net Present Value Calculations

Shown below are the Net Present Value Calculations for
DYL 260/280 in the U.S., DYL AUDIT (U.S. only) and DYL 260/280
in the international market.

We have allocated the tax asset value proportionately based on
the ratio of the total pre-tax profit of each to total pre-
tax profit from all three offerings.

These ratios were

$$
\begin{array}{ll}
\text{DYL 260/280 (U.S.)} = & .638 \\
\text{DYL AUDIT} = & .201 \\
\text{DYL 260/280 (Int'l)} = & .161 \\
\hline
& 1.000
\end{array}
$$

In these cases where there was a loss after deducting the
amortization from the pre-tax profit, we assumed that there
would be other company profits against which these tax losses could
be amortized so we have added the value of the loss to the pre-
tax profit.

These ratios were multiplied by the $7,636,000 asset value
assigned by Sterling Software, Inc. to the Dylakor products.

$$.638 \times 7636K = \$4872K$$

$$.201 \times 7636K = \$1539K$$

$$.161 \times 7636K = \$1229K$$

(K$)		DYL 260-280								TOTAL
		83	84	85	86	87	88	89	90	
(A)	Profit	972	1104	1082	1113	1069	823	693	1525	
(B)	Amortization	975	975	974	974	974				4872
(C)	PT Profit (A-C)	(3)	129	108	139	95	823	693	1525	
(D)	Tax (.5C)	(1)	64	54	69	47	411	346	762	
(E)	AT Cash Flow (A-D)	973	1040	1028	1044	1022	412	347	763	
(F)	PV COEF (6% AT)	.972	.917	.865	.816	.770	.726	.685	.646	
(G)	PV (F x E)	946	954	889	852	787	299	238	493	5458 ======

DYLAUDIT

	83	84	85	86	87	88	89	90	
Profit	214	291	318	354	358	288	253	566	
Amort	309	308	308	308	308				1539
PT Profit	(95)	(17)	10	46	50	288	253	566	
Tax	(47)	(8)	5	23	25	144	126	283	
AT Cash Flow	261	299	313	331	333	144	127	283	
PV	254	274	271	270	256	104	87	183	1699 =====

DYL-INT'L

	83	84	85	86	87	88	89		
Profit	49	250	333	439	439	351	247		
Amort.	246	246	246	246	245				1229
PT Profit	(197)	4	87	193	94	351	247		
Tax	(98)	2	43	96	47	175	124		
AT Cash Flow	147	248	290	343	392	176	123		
PV	143	227	251	280	219	128	84		1332 ========

		Total	8489

BUSINESS ANALYSIS REPORT
DIRECTIONS, INC.

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Date: March 8, 1983

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SECTION I - THE COMPANY

A. History

Directions, Inc. was founded in June 1976 by Ed Lott and
Terry Berndt. The company targeted the check processing
operations of the top 500 or 600 commercial banks for
a line of standardized software packages to support and aug-
ment primary check data capture systems. Subsequently, the
firm developed or acquired related packages to support sub-
sequent check processing activities. At present most of
the corporation's stock is owned by the two principals (30%
each) and the remainder by Sterling Software, Inc. (Sterling
purchased their 40% interest from Sam and Charles Wyly.)

B. Financials

The following represents the past sales performance of the
company based on bookings for the fiscal years ending on June
30th of the year indicated.

Year	Sales ($M)
1978	0.17
1979	0.23
1980	0.42
1981	1.19
1982	1.62
1983 (Plan)	2.06

The above figures are net of royalty expenses for two of the
products (30% for Vector II and 20% for Vector IV).

Recently, Arthur Young & Co. reconstructed the company's
financial records for the last three years to reflect fis-
cal years ending on September 30th of the year indicated.
In addition, they adjusted for changes from a cash to accrual
basis and used revised revenue recognition criteria. The new
figures are:

Year	Revenues ($M)
1980	0.40
1981	1.40
1982	1.86

The firm uses a financial management system to measure weekly
performance against sales targets by product and accounts.
The system tracks information on sales, accounts receivable
and prospects expected to close within 90 days.

On average, over the last two years, the company has
booked the following sales by quarter (based on June
30th fiscal years) even though the sales plan is straight
line:

Quarter	Percentage	Cumulative Percentage
1st	15%	15%
2nd	23%	38%
3rd	28%	66%
4th	34%	100%

As of January 15th, bookings totalled $980,000, or 48% of
its full year target and 61% better than the first two
quarters of the prior year.

Since its inception, Directions has never had to refund a
purchase, write off an accounts receivable or borrow funds.

C. Organization and Facilities

Edward J. Lott, as Chairman, and Terry W. Berndt, as Presi-
dent, share the responsibility of running Directions. Mr.
Lott is in charge of administrative and marketing activ-
ities while Mr. Berndt is the key technical person in charge
of all product design, development and maintenance.

Figure 1 shows the company's present organization; Appendix
A contains professional background information of key employ-
ees.

Almost all Directions personnel and all of its technical
people have check processing backgrounds and regularly
perform sales support functions, for which they are com-
pensated on a commission basis. In addition, they develop
product documentation, train users, assist in product
installation and provide ongoing technical support.

The firm's headquarters are in Dallas, Texas, and it has a
sales office in Sarasota, Florida. Typing support is pro-
vided on a contract basis by a word processing vendor in the
Dallas building. Computer time is leased from a sub-tenant,
Symbolics, Inc., a subsidiary of Lomas and Nettleton, Inc.
When needed, reader/sorter time is obtained from customers
at their locations. In turn, customers are not charged for
Beta test site support.

Figure 1
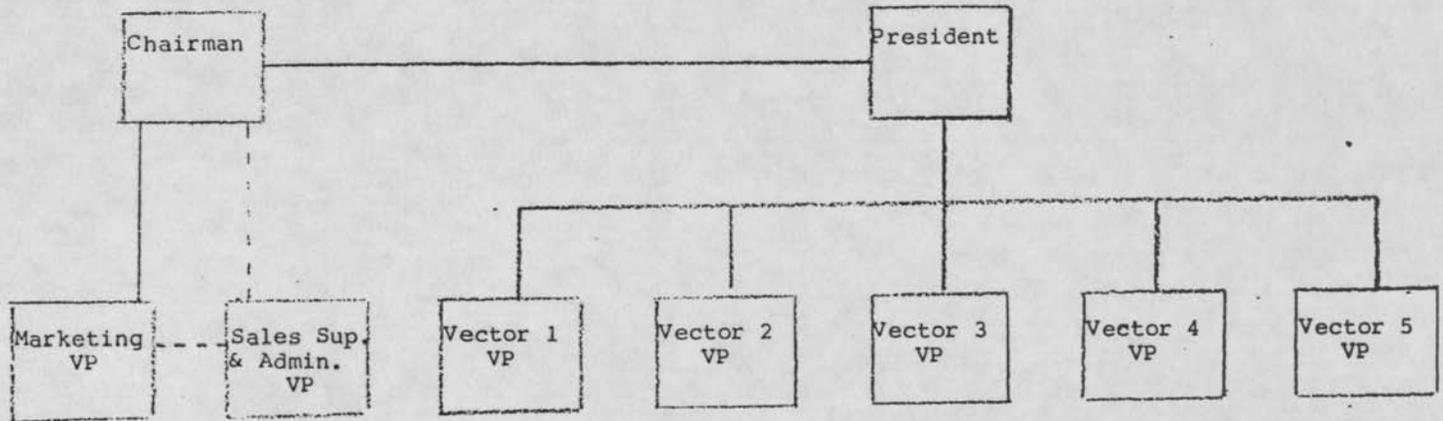
Directions' Company Organization

SECTION II - THE PRODUCTS

A. Functional Description

Directions' five products support and improve the check
processing operations of commercial banks. With a few
exceptions, all operate on IBM 360, 370, 30xx and 43xx
hardware under OS or DOS.

Vector I is an Item Processing Analysis and Reporting
System, which provides comprehensive reporting of trans-
action information tailored to the needs of the Cash Man-
agement, Correspondent Banking, Item Processing, and Corpor-
ate Account Departments of a bank. The product's main ob-
jectives are to aid in the improvement of bank profits by
optimizing funds availability, improving personnel utiliza-
tion, reducing operations costs and improving account
services.

Vector II is a Table Generator System designed for use
with IBM's Check Processing Control System (CPCS), a bank-
ing application software product which controls the IBM
3890 reader-sorter, a peripheral check processing hardware
device. Vector II allows a user department to define the
information required by CPCS to control the 3890 without
programmer involvement.

Vector III, a Bulk Filing/Online Fine Sort Support System,
is an online tool which can be used by the check process-
ing department to implement bulk filing of checks. It pro-
vides the following five primary functions: online trans-
action sorting, transaction cycle sorting, exception item
processing, statement fine sorting and online accumulated
transaction inquiry.

Vector IV, termed an Adjustments Processing System, is a
comprehensive, user-controlled tool designed to assist in
the research, resolution and control of intrabank adjust-
ment items. It maintains a complete inventory of outstanding
options to facilitate each phase of adjustment processing.
Initially a batch system, it was recently enhanced to pro-
vide online support.

Vector V, the most recent addition to the product line, is
an Automated Return Item and Exception Item System. It is
a comprehensive online system for processing interbank re-
turn items and automating the internal exception item deci-
sion process. Vector V is currently undergoing beta testing
at selected customer sites.

More comprehensive descriptions of the capabilities of each
product are given in Appendices B through F.

B. History

Vector I, Directions' first product, was developed by Terry Berndt and accounted for nearly all of the firm's initial package software bookings. A license for this product (unsupported original version) was sold to UCC which in turn markets it as the MRS option of their Super MICR package. As a result of this arrangement, Directions cannot sell Vector I to users of the UCC package.

Vector II was purchased from Texas Commerce Bank which had previously sold it nine times. After "cleaning-up" the code and the documentation, the package became an immediate success and contributed over $200,000 to bookings by June of 1981, exclusive of consulting support revenues and net of the 30% ongoing sales royalty to Texas Commerce Bank.

Vector III, also developed by Terry Berndt, began to make a substantial contribution to sales in the fiscal year ending June, 1980. The package has since been upgraded to provide support for image matching on an optional basis and an on-line inquiry module. The latter is priced separately but has not proven to be extremely popular in the marketplace and is superseded by Vector V. To meet competitor's capabilities, an option was developed for Vector III, running under CPCS, to allocate sorter-reader resources. This option requires four lines of code to be changed in IBM's CPCS software.

Two years ago, Vector IV was added to the product line. The underlying batch portion of this system was purchased from Performance Associates and had already been sold five times. Since then, the code and documentation have been upgraded and an online capability has been added. Performance Associates continues to receive an ongoing sales royalty of 20% on the basic portion of this package.

The company's most recent product is Vector V, again developed by Terry Berndt with the assistance of Mike Harris. It is currently being installed at four beta test sites and development should be completed by June of this year, according to the company.

Total development expense will reach $200,000 to $300,000 in the current fiscal year. This cost is believed to include the Vector IV release, the completion of Vector V development and the modification to allow Vector III to run under CPCS. Since all development costs are expensed in the year incurred, the earlier work on Vector V has been written off in prior years.

C. Competition

Directions currently defines its market as the IBM check processing system users and as such the company's primary competitor is IBM itself. For Vector I, II, III and IV, IBM sells competing though less capable products. To date, IBM has not announced a return item processing system similar to Vector V, although a small segment of this capability is provided by another of their products. The following paragraphs describe each individual product's competition.

As a stand-alone product, Vector I competes primarily with an IBM-supplied check processing reports package. However, while both provide transit and reject related information, Vector I offers reports by source and account as well. Thus, the Vector I user obtains cash management and account profitability and input quality. Vector I also competes with various MICR (magnetic ink character recognition) capture systems such as those marketed by FSA or IBM which provide a very limited subset of this information as part of their basic capability. The one exception is UCC's Super MICR package which offers a licensed version of Vector I as part of its product.

Other firms also operate in this market by providing a more detailed analysis of information collected by systems such as Vector I. They are competitors, however, in the sense that Vector I could be bypassed by utilizing information that was collected and entered manually.

Vector II is used to simplify the sort pattern development requirements for CPCS users. IBM offers the only other alternative to programmer intervention through a pair of field developed programs. (Both are usually required.) Vector II is reported to be superior, since it is easier for the nontechnical, check processing personnel to utilize.

IBM offers cycle sort programs to compete with Vector III although more intense competition is encountered from International Systems' Mighty Fine product. This package, originally developed by Omaha National Bank, sells for three thousand dollars less but is essentially an equivalent product.

Other than a DEC-based package developed by Citibank, the only competitor to Vector IV is IBM's Check Processing Archive Retrieval System (CPARS). CPARS is currently being used by approximately ten banks and is basically a Mass Storage-type system. (Mass Storage rents for about $30,000 per month.) While it is as yet unannounced, Security Pacific has developed an alternative, allowing the data to be stored instead on several large disks. This enhancement is likely to become licensed by IBM and marketed as an IUP. At the same time, Manufacturers Hanover is also modifying CPARS to provide access to data by amount, as opposed to only by capture or kill sequence. CPARS also had IUP's to create interim

statements and to support remote CICS assess. Based on these three improvements, CPARS could become a more effective competitor to Vector IV.

While little information is presently available concerning the Citibank product, it is known that the sales organization has been cut back, which will reduce their effectiveness.

Vector V currently has no competitors other than the Citibank System mentioned previously and an enhancement to Proof of Deposit Plus (marketed by FSA) which, in its present form, is believed to be available only to users of this capture system.

Additional information on competitors is contained in Appendices G through K.

D. Customer Acceptance

User surveys by service organizations such as Datapro could not be located. Based on knowledge of the industry and an analysis of cross-sell effectiveness (which is presented in Section III A below) it was determined that a client survey was not necessary to confirm that Directions enjoys a good reputation in the industry.

SECTION III - THE MARKET

A. Definition, Penetration and Trends

As of December 31, 1982, Directions had 122 client banks,
many of which had purchased packages for multiple sites and
over one-third of which were operating two or more of
Directions' products. As can be seen by scanning Appendix L,
the list includes many of the largest banks and bank service
companies in the country.

Sales for Vector I and II peaked in 1981 and have declined
substantially since. The growth curve for Vector III,
while still climbing at a rapid rate, is beginning to flatten
out. Vector IV and V are just beginning the growth curve.

A complete sales history is shown in Figure 2. Since the
figures represent both license fees and maintenance, the
true curve for new package sales is somewhat distorted.
That is to say, declines in sales are masked by ongoing
maintenance fees for packages already installed.

The fact that one-third of the clients have bought more than
one of Directions' products understates the degree to which
the firm has been able to sell additional products to ex-
isting clients. Actually, cross-sell effectiveness has
been close to 60% for mature products when adjustments are
made for the limitations imposed by the primary capture
systems being operated by each client. This point is further
explained in Figure 3.

Directions is somewhat limited in the scope of its potential
market. First, banks smaller than the top 500 or 600, and
the majority of the thrift institutions, are not likely to
have substantial check processing operations. Many have
these services provided by service bureaus or nearby commercial
banks. Secondly, the segment of the check processing business
held by Burroughs and NCR is not available. (Directions'
management considers this only a small percentage of the top
500 or 600 banks.) This tends to contain Directions to a
large but bounded overall check processing market.

To some extent, these bounds will be adjusted by trends in
the market place such as the consolidation of the thrift
industry. This could evolve into additional major check
processing operations centers providing the mergers are bas-
ically local in nature. Likewise, if the thrift industry
is successful in marketing new commercially-oriented products,
consistent with industry deregulation, additional facilities
might also result. However, it should be noted that this
expansion will probably take place over an extended period
of time due to the institutions' traditional lack of experience
in building and managing major back-office functions.

Figure 2

Directions, Inc.

Sales History ($)

FISCAL YEAR	VCTR I	VCTR II	VCTR III	VCTR IV	VCTR V	CON-SULTING	TOTAL
76	6,000	N/A	N/A	N/A	N/A		6,000
77	52,000	N/A	16,500	N/A	N/A	24,152	92,652
78	117,000	N/A	5,500	N/A	N/A	44,899	167,399
79	198,000	N/A	N/A	N/A	N/A	29,950	227,950
80	276,810	9,500	83,000	N/A	N/A	54,950	414,260
81	449,900	198,050	397,800	N/A	N/A	142,650	1,188,400
82	338,000	188,180	840,500	63,750	16,000	171,250	1,617,690
83 (plan)	55,500	61,000	634,700	129,000	48,000	51,300	979,500
TOTAL	1,493,210	456,740	1,978,000	192,750	64,000	519,151	4,703,851

Notes:

- 1983 figures include bookings through January 15, 1983

- Figures for Vector II and IV are net of associated royalty expense

- Figures for Vector I through V include both licensing and maintenance

- Consulting figures reflect amounts booked for generating interfaces to client systems, SCI code preparation, etc.

Figure 3

Cross-Sell Effectiveness

Product	# of Users	Estimated % of Potential Cross-sells realized
Vector I	52	55%
Vector II	40	66%
Vector III	70	57%
Vector IV	13	11%
Vector V	4	3%

Notes:

° Vector I cannot be used by the 28 banks operating UCC's Super MICR

° Vector II cannot be used by the above banks or by the 33 other non-CPCS users

° Vectors IV and V are new products

The upcoming regulations allowing nationwide banking could have a similar effect. Acquisitions of smaller banks in areas remote from the head office will prevent check processing operations from being consolidated because of inability to transport paper (the checks) quickly enough to meet transit deadlines. Thus, nation-wide banking could result in the formation of regional processing centers, thereby reducing the number of check processing operations which are too small to need the Vector product line.

Management also indicated that they saw a trend towards the use of microcomputers for various float analysis and online information retrieval functions; likewise, they indicated that requests for second site installations are increasing, which might suggest that the larger banks are breaking up their central processing operations to improve control and/or increase funds availability.

B. <u>Strategy</u>   .

Directions markets its products through its own sales force.
It makes use of advertisements in two trade magazines, Bank
Systems and Equipment and The Banking Journal, as well as
the ICP Publications (advertisements and listings). The
firm also takes a booth at the annual ABA Operations and
Automation Conference and at the BAI Check Processing Con-
vention. Hospitality suites are operated at both of these
trade shows and at various BAI workshops.

Directions also promotes business by assisting clients in
writing articles for various trade publications and in pre-
paring client presentations for forums such as the BAI work-
shops. (Vendors are usually excluded from direct partici-
pation in these activities.)

At present, the company is preparing a direct mail adver-
tising program initially directed to existing clients in an
effort to cross sell additional products. New prospects
will be added to the mailing list in the near future.

Salesmen do little "cold calling," concentrating instead on
leads generated by the above activities and customer recom-
mendations within the industry. Management recognizes that
the sales force should be enlarged, especially to improve
coverage on the West Coast. The company plans to hire
another salesperson to cover this area and to allow some
time for cold calling.

All other members of the staff provide sales support in the
form of follow-up presentations and receive bonuses on
billings for doing so. However, they lack experience to
handle the initial contact effectively.

Directions has encouraged the formation of user groups to
help promote a more thorough understanding of the capabilities
and potential benefits of its products. This is especially
true in the case of Vector I which only provides value to
the client if the information it produces is acted upon.
(Unfortunately, this user group has not met yet.)

In a similar vein, Directions provides inexpensively priced
courses (e.g., $150 for 3 days) to instruct new personnel at
existing client installations in product use/benefits. This
has the advantage of reducing inquiries from newly-assigned
personnel.

The management of Directions feels that the company's ex-
pertise is in marketing and supporting standardized yet
transportable software packages. They are opposed to cus-
tomizing software to support individual client desires since
this could substantially increase the cost and complexity of
maintenance, new product enhancements, etc. Likewise, it

would require the creation of a consulting staff, which, having different objectives, could lead to potentially detrimental situations for the company as a whole. However, recognizing the need for their programs to operate in dissimilar customer environments, separate interface programs are customized to client needs, thus maintaining product standardization. The interface software is developed by either Directions or the user organization.

While desiring to avoid building a consulting staff, management is aware that such may become necessary to renew interest in Vector I. Changes in the Federal Reserve's pricing policy prompted one-time interest in the package, but interest has since subsided, probably because outside of the large money center banks, management lacks the sophistication necessary to fully understand and utilize all of the information this product provides. In the interim, Tim Simeone has been assigned the task of promoting a greater understanding of Vector I.

It should be noted that Vector I logically extends into an area which could involve ongoing support and customer education. (This is a reference to simulation models which, based on constantly updated availability schedules, can optimize transit sort patterns to minimize float and transportation costs.)

The firm's philosophy of providing standard packages is consistent with management's assessment of its own strengths, namely marketing and support. While avoiding significant involvement in consulting and custom work, management also desires to avoid major development efforts. Thus they would much prefer to buy and "clean up" a package than to build it internally from scratch. This strategy keeps risk to a minimum and avoids the need to provide significant amounts of capital to fund the development effort.

An opposing argument would appear to be that 85% of all package sales to date and 80% of package sales to date in the current fiscal year are attributable to internally developed products. (Based on net sales after royalty expense.) However, one man is principally responsible for this development effort and the company's development capabilities would have to be increased significantly if major development projects were undertaken.

Directions intends to continue to limit its activities to its current specialty area. Further, it prefers to remain in the aftermarket, providing relatively small support packages rather than the primary capture and transit item processing systems which are large, complex and entail substantial costs and risks.

Another advantage of addressing the aftermarket is that it tends to avoid difficult sales to the bank's EDP department. Faced with broader scale issues, and possibly a major implementation program, the bank EDP management prefers to avoid concerning itself in detail with the minor support tasks. Thus, a recommendation from the Check Processing Department to purchase a support package for various functions is usually welcomed and not subjected to intense scrutiny. This also explains why Directions is more closely associated with users rather than technical personnel in the client organizations.

C. Pricing Policies

Directions sells its clients a license to use its products
in perpetuity. Maintenance is provided at an annual
charge which equals 8% of the license fee. Software inter-
faces to the client's existing software (other than for
Vectors I and II) are provided upon request and priced
based on the degree of effort required. Current prices
are shown in Figure 4.

As a general rule, Directions will not reduce its prices.
It is felt that because of their reputation and product
quality, along with conservative funds management philoso-
phies, they do not have to bow to price cutting measures.
(Directions maintains an uncommitted reserve of 6 months
of cash, money market instruments and/or accounts re-
ceivable at all times.)

For a limited time after purchase, Directions will offer
its clients a 5% discount on additional packages ordered.
New customers desiring packages for a large number of sites
simultaneously will be offered a special price. However,
one inviolate rule is that this price will never be less
than that paid by a previous customer with similar require-
ments. Effective February 15,1983, other customers wishing
to obtain packages for secondary sites are charged 70% of the
list price for the second site and 50% for each additional site.

License fees include 5 days of on-site technical support
of the user's installation process. Since successful
implementation is critical to the firm's marketing effort
and industry reputation, this 5 day limit is not strictly
enforced.

Additional charges are not levied if the customer changes
from DOS to OS or upgrades the reader sorter equipment from
1419s to 3890s.

Maintenance contracts are taken by 95% of the customer base.
Contracts provide for correction of software bugs and tech-
nical support by telephone only. Because of the growth in
the size of the installed base, maintenance is rapidly be-
coming a significant revenue producer. This year, $200,000
in maintenance income is expected and next year this amount
is projected to double.

Enhancements are generally licensed separately. This is
not seen as a major problem since regulatory changes seldom
affect check processing operations.

To date, both existing clients and new customers have paid
for the enhancements to Vector I for federal pricing ($4,000)
and Vector IV for the online upgrade ($10,000). An enhance-
ment to Vector III to provide image match capability was
given to existing customers free of charge for marketing
reasons.

Figure 4

Software License Fees

Vector I	Package	$36,000	
	Custom Interface	$ 5,000	(with 50% of sales)
Vector II	Package	$24,000	(including royalty)
	SCI Code Preparation	$ 7,500	(with 50% of sales)
Vector III	Package	$32,000	
	On Line Inquiry	$ 8,000	(rarely used)
Vector IV	Package	$30,000	(including royalty)
	Online Upgrade	$10,000	(with most of sales)
Vector V	Package	$25,000	(to be increased to $32,000 effective April 1, 1983)

D.   Risk Analysis .

The most significant risk faced by Directions is the loss
of Terry Berndt. His development work resulted in over
$10 million in revenues for UCC and the vast majority of
the income for Directions. Being a small company, the loss
of other individuals could also be detrimental, but certain-
ly less significant.

The firm lacks significant experience with Burroughs and
NCR hardware and microcomputers, all possible avenues for
expansion.

Major changes in IBM hardware and/or operating systems
could require software modifications although the potential
impact is not clear.

UCC could possibly be a more aggressive competitor. How-
ever, quality UCC support would be needed if they wished
to do so.

Finally, IBM sells competing applications software which,
if developed further and aggressively marketed, could cut
into Directions' market share. This is especially true
since IBM is the prime equipment vendor and therefore has
an advantage over outside firms in selling its products.

· KEY PERSONNEL PROFILES

Edward J. Lott, Chairman

For the past twenty years, Mr. Lott has held various positions related to bank data processing. From 1961 through 1964 he was a staff consultant with Booz Allen and Hamilton where he worked on bank data processing studies with a number of commercial U. S. banks. From 1964 through 1969 Mr. Lott was Executive Vice President of American Fletcher National Bank in Indianapolis where he was in charge of Operations and Corporate Planning. Mr. Lott left American Fletcher in 1969 to co-found Results, Inc., a highly successful software company specializing in proprietary software for commercial banks. Results, Inc. was acquired by University Computing Co. in 1972, where Mr. Lott was a senior officer in the firm's Banking Division until leaving to co-found Directions, Inc. with Mr. Berndt in 1976. Mr. Lott is responsible for Administration and Marketing activities within the firm.

Terry W. Berndt, President

For the past fourteen years, Mr. Berndt has been engaged in the design and development of bank application software. In the late 1960s Mr. Berndt was employed at the Central National Bank of Cleveland where he was responsible for Deposit Systems development in the EDP division. Mr. Berndt joined Results, Inc. in 1970 where he was responsible for the development of the firm's MICR capture software systems. Mr. Berndt continued in this role at University Computing Co. after the acquisition of Results, Inc. in 1972 and until leaving in 1976 to co-found Directions, Inc. with Mr. Lott. Mr. Berndt is responsible for all product design, development and maintenance within the firm.

\VECTOR1

Item Processing Analysis and Reporting System

\VECTOR1 is a means of obtaining meaningful analysis and reporting of all item processing and other transaction activity thru a single system.

\VECTOR1 provides a comprehensive reporting of transaction information for Cash Management, Correspondent Banking, Item Processing, and Corporate Account Departments.

\VECTOR1 objectives are to aid in the improvement of bank profits through optimizing funds availability, improving personnel utilization, reducing operations costs, and improving account services.

\VECTOR1 reporting on a daily and historical basis is keyed to:
- a. Float Management with comprehensive analysis of transit activity with emphasis on end point cost analysis, Fed Pricing comparisons, etc.;
- b. Account officers with information by account on deposit activity sources, transaction costs, deadline and dollar distribution of activity, etc.;
- c. Funds/Cash Management with information on funds availability and transit activity in a variety of ways including "What If" modeling capabilities; and
- d. Operations Management with statistical information on transaction activity by source of input, time of day, etc. and reject analysis by input devices, operators, accounts, reject categories, etc.

\VECTOR1 operates on any large scale IBM CPU in a stand-alone mode with various MICR capture systems, i.e., IBM/CPCS, DOSCHECK, Burroughs IPS, or "INHOUSE" developed systems.

\VECTOR1 processing options are controlled via an Analysis Control File with the user having complete control over report selection, frequency, detail, and reporting elements.

\VECTOR1 has a modular structure which allows for implementation of any one or all of the key analysis areas.

A SOFTWARE PRODUCT OF
DIRECTIONS, INC.
For more information on VECTOR I contact Directions, Inc. • Director of Marketing
1740 N. Collins Boulevard • Richardson, Texas 75081 • Phone: (214) 238-8250

\VECTOR1
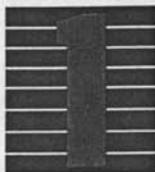
Item Processing Analysis and Reporting System

\VECTOR1 Provides:

TRANSIT ANALYSIS

Transit Analysis Reports— 15 types, with reporting detail available according to a user-defined hierarchy (7 levels including District. End Point, your availability schedule, etc.).

- End Point Analysis by Day of Week
- End Point Cost Analysis by Day of Week
- End Point Cost Analysis Summary
- Projected Cost Analysis by Day of Week
- End Point Deposit Exceptions
- Transit Amount/Volume (daily and historical)
- Transit Amount/Volume By Times of Day
- Transit Deadlines Met and Missed (actual and projected)
- Transit Amount Volume By Day of Week
- Transit Dollar Cut—Profit/Loss (actual and projected)
- Operational Float/Bettered Availability
- Transit Routing Time of Day Distribution

ACCOUNT ANALYSIS

Account Analysis Reports

- Account Deposit Detail (by individual and/or all deposits)
- Account Deposit Costs by Transit Detail
- Account Transaction Category Summary
- Account Dollar and/or Deadline Distribution (Customer Times vs. Bank Times)
- Account Average Transit Activity
- Account Exception Analysis

SOURCE OF INPUT AND TRANSPORTATION ANALYSIS

Source and Transportation Analysis Reports

- Transaction Category Summary by Source
- Source Analysis Summary by Transaction Category
- Source by Time of Day
- Source Transit Analysis (by Time of Day and Day of Week)
- Source Transportation Summary

REJECT/VOLUME ANALYSIS AND WORKFLOW MEASUREMENT

Reject Analysis and Workflow Reports:

- Reject Volume Job Summary w/Sorter and Sorter Operator Summary
- Reject Volume (by Source, Time of Day, Operator, Device, etc.)
- Reject Ranking Report (by Operator, Device, etc.)
- Operator Workflow Summary
- Workflow Analysis Summary

OPERATIONS MANAGEMENT REPORTING

- Daily Operations Summary (by Transaction Costs and Transit Costs of Funds)
- Transaction Code Activity Analysis
- Operation History Summary
- Transaction Category Activity Summary (by Day of Week and/or Week of Month)

IIVECTOR2

User Controlled Table Generator System

IIVECTOR2 is a user controlled Table Generator System designed to interface with IBM's CPCS and 3890 Reader/Sorters. VECTOR II is a means of transferring the environmental control over changes in a bank's capture structure (sort patterns, etc.) to the Check Processing Department.

User control is maintained over the following required and optional tables:
- Transit Routing Sort Pattern
- ABA Sort Table
- Fed Holiday Tables
- Account Sort Tables
- Account Serial Validation and Sort Tables
- Process Code Validation and Sort Tables
- Serial Sort Table
- End-Point Table
- BCF Controlled Application Edit Table
- Bank Name and Address Table (for CPCS)
- End-Point Release Table
- Sort Pattern Definition Table
- Float Table

IIVECTOR2 is designed to allow maximum flexibility in the sorting and editing of documents across all types of captures, at the same time optimizing the memory and functional characteristics of the 3890 to their fullest extent. VECTOR II generates all of the CPCS required tables, as well as any or all of the CPCS user tables for proper editing and stacker selection of items; i.e., the transit sort patterns, with or without dollar sorting; process code validation and conversion; ARP, payable thru, and high volume account selection; serial number validation; float assignment options, etc. Vector II is structured to run in a concurrent mode with pre-existing sort patterns prior to and during conversion.

IIVECTOR2 allows capture structures to utilize tables already established in previous captures and additionally provides for dynamic table loading; 3890 core maps and production edit maps; cross typing of secondary captures from multiple prime pass captures; source table maintenance through a single control program; creation and maintenance of Bank Control File, etc.

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IIVECTOR2

User Controlled Table Generator System

IIVECTOR2 provides support in the following areas:

1. 3890 AND SCI
   - Control for various 3890 Sorter Functions
   - 3890 Core Mapping
   - Fully supported SCI Routines
   - Optimization of Core Requirements with Binary Search Routines and ABA Sub-Tables
   - Reduce Controls Hard Coded in 3890 Routines
   - Automatic digit correction on transit routing field
   - Automatic dollar correction on travelers checks

2. UNIQUE SORTING PROVISIONS
   - Dollar Discrimination of Items by End-Points or Specific T/R Numbers
   - Sorting based on Account or Serial Number Ranges or Defaults
   - Provides for Stacked Secondaries (Rehandles) from Multiple Prime Passes or Sort Patterns

3. USER MAINTENANCE
   - Eliminates the need for programmer effort to make Sort Pattern changes
   - Timely Sort Pattern changes to meet correspondent availability schedules
   - Eliminates need for Compiler and Linkage Editor
   - Supports Librarian, Panvalet, and standard Partition Data Set maintenance functions

4. FLOAT ADJUSTMENT/ASSIGNMENT
   - Individual Fed Holiday Tables for automatic float adjustment
   - System supported application float tables and access routines
   - User determination if float is to be assigned at time of capture or release time
   - Three time periods provided for determining account availability

5. EDIT CONTROLS
   - Ensures correct sort structure for specified banks
   - Ensures that all tables are correct prior to production

IIVECTOR2 provides standardized SCI and OLRR programs as part of the base system greatly reducing or eliminating much of the programming effort for installation of a sort pattern generator system.

A SOFTWARE PRODUCT OF
DIRECTIONS, INC.
For more information on VECTOR II contact Directions, Inc. • Director of Marketing
1740 N. Collins Boulevard • Richardson, Texas 75081 • Phone: (214) 238-8250

IIIVECTOR3

Bulk Filing/Online Fine Sort Support System

IIIVECTOR3 is an online transaction sorting and bulk filing support system.

IIIVECTOR3 is a single comprehensive system which supports bank transaction sorting requirements in five primary areas:
- Online Transaction Sorting
- Transaction Cycle Sorting
- Exception Item Processing
- Statement Fine Sorting
- Online Accumulated Transaction Inquiry (available separately)

IIIVECTOR3 is designed around and operates in conjunction with a user defined and maintained Sort Control File and user defined activity files, i.e., transaction exception file, image match file, daily activity file, etc.

IIIVECTOR3 dynamically constructs its sort control parameters from simple sort functions entered by the operator through a video device.

IIIVECTOR3 monitors and performs the requested sort operation according to the user specified processing and edit criteria maintained in the Sort Control File.

IIIVECTOR3 Online Sorting features include:
- All system functions and requests controlled through video devices (CRT)
- Operator assistance provided through displayed instructions
- Pass-to-pass Sort Control, i.e., item sequence checking, pass volume checking, etc.
- System Restart/Resort capability at any point
- System Termination/Restart at any point
- Resource Re-allocation under operator control

IIIVECTOR3 operates under either DOS (V/S, VSE) or OS (VS1, VS2, MVS) and provides support for IBM 3890 (Model A or B), 2956, or 1419 Sorters; and IBM 3277 Model 2 CRT units or compatible CRT units.

IIIVECTOR3

Bulk Filing/Online Fine Sort Support System

IIIVECTOR3 provides processing support in five primary areas:

1. ONLINE TRANSACTION SORTING
   - Multiple Sort Types (Block sort, directed, with high volume kill)
   - Variable Sort Fields (Sort on any Field)
   - Multiple Field Sorting (Serial number Within Account, etc.)
   - Co-mingled Bank Sorting With Exception Item Pull
   - User specified edit criteria (exact values or ranges)
   - Multiple Sorter Support (up to 6 with automatic "load leveling")
   - Optional Statistical Reporting (Sorter, Operator, Reject, Audit)

2. TRANSACTION CYCLE SORTING
   - Variable Cycle Sort (Table Sort or Image Match)
   - Out of Cycle Accounts
   - Signature Verification Pulling
   - Automatic Secondary Cycle Sort Passes
   - Missing Item Reporting for Image Match Processing

3. EXCEPTION ITEM PROCESSING
   - Fine Sort or Cycle Sort (Table Sort or Image Match)
   - User Defined Exception Criteria by Type (Match criteria, report description, priority pull sequence)
   - Variable Match Criteria (i.e., account-amount, account-serial)
   - Automatic account and type sorting
   - Optional "All Activity Pulling" by selected account
   - User Exception Reporting (Unmatched by account or account within type, exception summary, signature pull list)

4. STATEMENT FINE SORTING
   - Variable Sort Sequence (Account, Zip Code, Mail Code, etc.)
   - Automatic Enclosure Count Verification with Exception Report
   - Account Separation Document Insertion (no encoding required)
   - Item Truncation Support
   - No Preblocking Requirement

5. ON-LINE TRANSACTION INQUIRY (AVAILABLE SEPARATELY)
   - Wide range of inquiries for both account and transaction related data
   - User Specified History Retention
   - Variable Cumulative Cycle-to-Date Reporting
   - User Defined Online Security Levels
   - Operator Oriented Displays
   - Operator and Inquiry Statistical Reporting
   - Runs under CICS or Stand-Alone

A SOFTWARE PRODUCT OF

DIRECTIONS, INC.

IVVECTOR4

Adjustments Processing System

IVVECTOR4 Provides:

OPERATING REPORTS

Operating reports provide information in various sequences about open items to aid in the research and resolution process

A. LOGS — lists all open items on the system and provides appropriate totals in the following sequences:
- Dollar Amounts Log
- Item Date Log
- Clerk Log
- Account Log
- Source Log
- Type Log
- Group Log

B. SPECIAL PURPOSE LISTINGS — lists all item containing specific reference information by:
- Adjustment Number
- Priority Code
- Tracer/Block/Sequence
- ABA Number
- DDA Number

C. FINAL DISPOSITION REPORT — lists all closed items for specified period.

D. POTENTIAL OFFSET REPORT — lists all items which may be potential offsets.

AGING AND STATISTIC REPORTS
- Aging and Statistical Totals for Department
- Aging and Statistical Totals for Clerk
- Aging and Statistical Totals for Account
- Aging and Statistical Totals for Source
- Aging and Statistical Totals for Type
- Aging and Statistical Totals for Type Within Account
- Aging and Statistical Totals for Type Within Source
- Aging and Statistical Totals for Source Within Account

AUDIT TRAIL AND CONTROL REPORTS
- Adjustment Update Audit Report
- Adjustment Item Additions
- Adjustment Item Offsets
- Adjustment Item Charge-Offs
- Automatic Charge-Offs
- Account Reconciliation Report
- Deleted Adjustment Items
- Statistic Update Audit Report
- Statistic Information Listing

ONLINE FUNCTIONS
- Full data entry with complete editing
- Extensive inquiry into system files
- Search facilities (by rate, dollar, sequence, type, account, etc.)
- Operates under IBM CICS

CORRESPONDENCE SUBSYSTEM
- Both inquiry and response letters
- Automatic follow-up letters
- User defined text
- Permanent and temporary names and addresses
- Letter Pending Report

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For more information on VECTOR IV contact Directions, Inc. • Director of Marketing
1740 N. Collins Boulevard • Richardson, Texas 75081 • Phone: (214) 238-8250

IVVECTOR4

Adjustments Processing System

IVVECTOR4 is a comprehensive user-controlled system which provides a variety of tools to aid in the research, resolution and control of adjustment items.

IVVECTOR4 maintains a complete inventory of outstanding adjustment items with complete audit trails and user defined processing options.

IVVECTOR4 facilitates every phase of Adjustment processing to realize the following objectives:
- Reduce losses by decreasing write-offs
- Improve control by tracking items received and processed
- Reduce redundant clerical effort
- Improve operational efficiency
- Enhance managerial controls by providing information necessary to isolate problem areas and prevent adjustment situations from recurring
- Reduce training effort and turnover by providing more sophistication in working environment
- Maintain a complete file of adjustment items so as to provide up-to-date statistical and financial information on a more timely basis
- Make it economically feasible to research and resolve lower dollar value items

IVVECTOR4 provides an extensive user controller reporting capability for report selection, generation, and content.

IVVECTOR4 online facilities further enhance the research effort through extensive inquiry/search functions and data entry capabilities.

IVVECTOR4 automatic charge-off of adjustment items because of lower dollar amounts or because the item has not been resolved in a defined period of time according to criteria established by the user.

IVVECTOR4 provides for determining potential offsets by matching items against other items on the file to determine potential matches. Both open and charged-off items are included in this process.

IVVECTOR4 retains closed items for a period of time specified by the user.

IVVECTOR4 produces a series of Aging and Statistics reports by account code, clerk number, source code, and type code.

IVVECTOR4 includes a Correspondence Subsystem which produces both inquiry and response letters with automatic follow-up. Information from the Adjustment Master File may be included in the letters.

VECTOR V

GENERAL DESCRIPTION

VECTOR V is a comprehesive two phase online system for processing interbank return items and automating the internal exception item decision process.

VECTOR V was designed for ease of use through its many online options for the decision making function.

RETURN ITEM PROCESSING

VECTOR V Return Item Processing provides a bank with the means of better controlling the "flow" of returned items into and out of the bank in a more timely fashion by increasing the accuracy of the research function.

VECTOR V accommodates both "incoming" item returns and "outgoing" item returns through common processing for resolution and disposition of the item.

VECTOR V provides for Online Depositor Identification via an All Items File. This file is maintained in both item capture sequence and transaction amount sequence. The user determines the retention period of any item in the file according to item type.

VECTOR V provides for an online Special Instruction File to support the research process. This file contains user defined instructions on how to handle any given account's returns. Instructions may indicate the item is to be charged to another account, redeposited, suspensed, no return charge, etc.

VECTOR V also provides for creation of the reversing entry for the return according to type of item. The entry is created in industry standard NACHA format.

VECTOR V provides the user with the option of preparing Return Item Notices back to the customer by creating a file for use by the bank.

VECTOR V automatically generates return item cash letters to be sent to the local FRB, clearing house, other bank, etc. Special handle items such as cashed checks, loan payments, etc. are also provided for via special instructions.

VECTOR V provides for inputting of Return Items through its own online facilities or optionally allows the user to enter them via the bank's Data Entry function or thru a MICR capture file.

VECTOR V Return Item Processing provides for complete Balancing, Control and Audit Trails. This includes balancing of incoming return item cash letters to ensure proper disposition, preparation, and balancing of outgoing return item cash letters.

EXCEPTION ITEM PROCESSING

VECTOR V Exception Item processing provides the bank with the capability of reviewing exception items and making the pay/return decision in an online environment.

VECTOR V accommodates a bank's "pay all" or "pay none" posting philosophy by creating the appropriate reversal or force pay entries back to the application. The user can specify by type of item what entries should be generated along with optional OD/NSF charge transactions.

VECTOR V can automatically generate return item cash letters from the exception item returns. These cash letters would be sent to the local FRB, clearing house, other bank, etc. Instructions on special handle items such as cashed checks, loan payments, etc. are also provided via the online Special Instructions File.

VECTOR V generates detail audit trail and balancing reports to facilitate control over the exception return item.

VECTOR V can interface with Directions' VECTOR III Bulk Filing/Online Fine Sort System to effect the separation and distribution of exception items into paid item (cycle) groups, cash letter groups, etc.

VECTOR V Return and Exception Item processing is user controlled via a Return Item Control File from which all system processing parameters are acted upon. Each bank will have its own variable processing parameters. All parameters are maintained in an online mode thus eliminating batch processing requirements for timely changes.

VECTOR.V provides general inquiry functions for search and retrieval of any items in its All Items File. These functions can be used to facilitate the operations in other areas including adjustments, research, etc.

VECTOR V is interfaced to a bank's application systems via a series of Interface File create steps which take the bank's data and convert it to VECTOR V format.

VECTOR V operates in an online environment using its own stand-alone monitor or IBM's CICS monitor facilities.

VECTOR V operates on IBM 370/43XX/30XX level mainframes under DOS and/or OS and related VS/VM functions, IBM 3277 Model 2 CRT units (or compatible units) and optionally IBM CICS monitor.

VECTOR V provides:

Online Operations

VECTOR V provides an extensive set of online operating functions for the three main areas of system processing. These are Return Items, Exception Items and System Maintenance. The functions in each area are designed to faciliate the inquiry/decision process. All functions are designed to be "user friendly" from time of operator signon thru logoff.

The System makes use of preprogrammed CRT "Function" keys in each area thereby allowing the user to switch from one function to another with ease.

A.   Return Item Processing

This area allows the user to handle all functions related to the Return Item process.

First would be to OPEN CASH LETTER to establish the balancing controls, ID and description information. Next would be RETURN ITEM ENTRY where the user could input the return items (unless entered via Data Entry or MICR Capture). These items would be stored for subsequent research.

A POTENTIAL MATCH LIST of items from the All Items File can be displayed as well as a DEPOSIT DETAIL LIST of items in the original deposit. RETURN ITEM DEPOSITOR Information including Special Instructions can be displayed to determine what action to take on any item. A RETURN ITEM VERIFICATION display is provided to allow the user a chance to review and if need be correct the action taken. The user can then cause a RETURN ITEM REVERSAL to be created. Finally a complete list of RETURN ITEMS PROCESSED is available for review.

A CASH LETTER BALANCE Display allows the user to check the balance status of the cash letters at any time.

B.   Exception Item Processing

This area allows the user to handle all functions related to Exception Processing.

The user would start with a review of the EXCEPTION PAY-RETURN Group of items and designate on the screen which items to Pay and which to Return. During this process the user can "view" an EXCEPTION BALANCE DISPLAY by account by Exception Type (i.e. NSF, Stop Pays, etc.) to determine what action should be taken. Once the decisions are made, an EXCEPTION PAY-RETURN VERIFICATION is requested to give the user a chance to review it prior to finally submitting it. The system provides a list of PROCESSED ITEMS and an EXCEPTION SUMMARY BALANCE by Exception Type to confirm the balancing controls imposed by the user and the system. Finally, the user can view at any time the defined list of Exception Types and Return Reason Codes to help with the decision.

C.   System Maintenance Processing

This area allows the user to review and maintain all system processing parameters, instructions, stop pay data, etc.

The user can DISPLAY CONTROL FILE to review its contents at any time. Should changes, additions, deletions, etc. be necessary, the user can perform them as needed thru CONTROL FILE MAINTENANCE.

The Special Instruction File can also be reviewed for either single accounts or all accounts. Instructions can be added, changed or deleted as required.

Stop Payment information can also be maintained by the system. A user can check by account for pending stop pays or the entire file can be reviewed. Additions, changes and/or deletions can also be made as needed.

Operating Reports

VECTOR V provides the following reports as part of its processing features:

o   Return Control File Edit List
o   Online Exception Audit Totals
o   Stop Payment Audit Totals
o   Deposit List (Item Sequence and Amount Sequence)
o   Return Item Cash Letter Audit Totals
o   Return Item Cash Letter
o   Return Item Detail Audit List
o   Exception Item Audit Summary Totals
o   Exception Item Detail Audit List
o   Exception Item Return Audit List
o   Special Instruction List
o   Monthly Return Item Statistics
o   Monthly Exception Item Statistics
o   Monthly Operator Statistics

Vector I Competitors

Supplier	Product	Type Code[1]	# of Users	Price	Systems
Directions	Vector I	A	50	$36K	360/370 OS/DOS
IBM	Reports Package	A			
LWFW	Consulting Service[2]	A		$ 8K	
U.C.C.	MRS Option for Super MICR	B	40[3]		360/370
EDS	Item Control System	B			360/370 OS/DOS
FSA	Proof of Deposit Plus	B	40[3]		360/370 OS/DOS
IBM	Proof of Deposit Transit Sysyem	B		$143/mo	System 3
IBM	Proof of Deposit Using Subrc 8	B		$120/mo	System 3
TMI	Worksim-Analysis Package	C	25		360/370
Littlewood & Shane	Consulting Service[4]	C			
Decision Systems	Hardware/Software Package[5]	C			IBM P.C.

Note #1:

A = Stand-alone

B = Provided as part of capture system

C = Provides further analysis of Vector I (or equivalent) output

Note #2   This consulting firm performs a one-time analysis
under a consulting arrangement and subsequently sells
their support package to such clients.

Note #3   For basic item capture program.

Note #4   This consulting firm has a simulation model with
constantly updated availability schedules.

Note #5   This consulting firm has developed a similar system
for small banks on the IBM personal computer (sells both)

.Vector II Competitors

Supplier	Product	# of Users	Price	Systems[1]
Directions	Vector II	40	$24K	360/370 3xxx/43xx
IBM	Check Processing Sort Pattern Generator		$270/mo	360/370
	and[2]			
	On Us Editor			360/370

1 All under OS, since product is an enhancement to IBM's CPCS

2 Both programs are usually required in place of Vector II

Vector III Competitors

Supplier	Product	# of Users	Price	Systems
Directions	Vector III	70[1]	$32K	360/370
IBM	3890 Cycle Sort (OS)	?	$610/mo	360/370 OS
IBM	3890 Cycle Sort (DOS)	?	$480/mo	360/370 DOS
International Systems	Mighty Fine	40	$28K	360/370 OS/DOS
IBM	1419 Fine Sort	?	?	360/370 OS
Lorain National Bank	On line MICR Fine Sort	40[2]	$1250/mo.	360/370 DOS

1 Most recent ICP directory lists 25 users

2 Includes Burroughs and IBM 1419 versions

Vector IV Competitors

Supplier	Product	# of Users	Price	Systems
Directions	Vector IV	13	$30K	360/370 OS/MVS
IBM	Check Processing Archive Retrieval System (CPARS)	10	900/mo	360/370 OS
Citibank	?	?	?	DEC

Vector V Competitors

Supplier	Product	# of Users	Price	Systems
Directions	Vector V	4	Over $25K	360/370 43xx/30xx OS/DOS
FSA	Enhancement to Proof of Deposit Plus	?	$12-14K	360/370 OS/DOS
Citibank	?	?	?	DEC

VECTOR I - Item Processing Analysis & Reporting
VECTOR II - CPCS Table Generator System
VECTOR III - Bulk Filing/Online Fine Sort Support
VECTOR IV - Adjustments Processing System
VECTOR V - Automated Return Item and Exception Item System

CLIENT LIST

Client Name	Vector System					MICR Capture System	Operating System
	I	II	III	IV	V		
Affiliated Banks, Denver			X			UCC	MVS
American National Bank, Chicago	X	X	X			CPCS	MVS
The Arizona Bank, Phoenix	X	X				CPCS	MVS
Atlantic Banks, Jacksonville	X					CPCS	MVS
Austin National Bank, Austin, Tx.			X			UCC	DOS/VSE
Banc Texas Services, Dallas			X			UCC	DOS/VSE
Bank of America	X	X				"In-House"	MVS
Bank of Hawaii	X	X	X			CPCS	MVS
Bank of New England	X	X				CPCS	MVS
Bank of New Orleans		X	X			DOSCK	DOS/VSE
Bank of New Jersey			X			DOSCK	DOS/VSE
The Bank of New York	X					CPCS	MVS
BancOhio National Bank, Columbus, OH				X		CPCS	IMS
Bank of the South, Atlanta	X	X	X			CPCS	MVS
Bank of the Southwest, Houston			X			UCC	DOS/VSE
Bank One, Columbus, Ohio	X		X			DOSCK	DOS/VSE
Bankers Trust, Columbia, SC			X			"In-House"	MVS
BayBanks, Inc., Boston	X	X				CPCS	MVS
Birmingham Trust Company				X		CPCS	MVS
Capital National Bank, Austin	X	X	X			CPCS	MVS
Central Bancompany, Jefferson City, MO.			X			UCC	DOS/VSE
Citizens and Southern, Atlanta	X					CPCS	MVS
Commerce Bank, Kansas City	X					CPCS	MVS
Commerce Union, Nashville			X			UCC	DOS/VSE
Connecticut Bank & Trust		X		X		CPCS	MVS
Continental National Bank, Ft. Worth			X			UCC	DOS/VSE
Corpus Christi National, Corpus Christi			X			CPCS	MVS
Correspondent Resources Inc.			X			UCC	DOS/VSE
Crocker National Bank, L.A.	X					CPCS	MVS

CLIENT LIST

Client Name	Vector System					MICR Capture System	Operating System
	I	II	III	IV	V		
Flagship Banks, Tampa		X				CPCS	MVS
Fort Worth National Bank			X			DOSCK	DOS/VSE
Frost National Bank, San Antonio	X					CPCS	MVS
Guaranty Bank, Lafayette, LA			X			DOSCK	DOS/VSE
Harris Bank, Chicago	X	X				VM/MVS	
Hartford National Bank				X		CPCS	MVS
Home Properties, Inc., Honolulu		X				UCC	MVS
Indiana National Bank, Indianapolis	X		X			"In-House"	MVS
Industrial Valley Bank, Pa.			X			UCC	DOS/VSE
Interfirst Bank - Dallas			X			"In-House"	MVS
Interfirst Services Corp., Houston				X		"In-House"	MVS
IntraWest Bank of Denver	X					IPS	MVS
Key Services Corp., Albany, NY			X			DOSCK	DOS/VSE
LaSalle National Bank, Chicago	X		X			UCC	DOS/VSE
Lincoln First Banks, Rochester	X		X			UCC	MVS
Louisiana National Bank, Baton Rouge			X			UCC	MVS
Maine National Bank			X			UCC	DOS/VSE
Manufacturers Hanover, N.Y.	X	X				CPCS	MVS
Marine Bank, Milwaukee			X			UCC	MVS
Marshall & Ilsley Bank, Milwaukee	X		X			CPCS	MVS
Mellon Bank, Pittsburgh	X					"In-House"	MVS
Mercantile-Safe Deposit, Baltimore	X			X		CPCS	MVS
National Bank of Commerce, Memphis			X			UCC	DOS/VSE
National Bank of Georgia		X	X			CPCS	MVS
New Jersey National, Trenton			X			UCC	DOS/VSE
Northeast Bancshare Assn., Portland			X			DOSCK	DOS/VSE
Northeastern Bank, Scranton	X	X				CPCS	MVS
Old Kent Bank, Michigan			X			DOSCK	DOS/VSE
Old National Bank, Spokane	X					CPCS	MVS
Peoples National Bank, Seattle	X					CPCS	MVS
Philadelphia National Bank			X			"In-House"	MVS
Pittsburgh National Bank	X	X		X		CPCS	MVS
Puget Sound National Bank, Tacoma	X					DOSCK	DOS/VSE

DIRECTIONS, INC.

CLIENT LIST

Client Name	Vector System					MICR Capture System	Operating System
	I	II	III	IV	V		
Republic National Bank, Dallas	X	X	X	X		CPCS	MVS
Riggs National Bank, Washington D.C.		X				CPCS	MVS
Security Pacific National Bank, L.A.		X				CPCS	MVS
Shawmut Bank, Boston		X	X			CPCS	DOS/VSE-MVS
Society National Bank, Cleveland	X	X	X			CPCS	MVS
Southeast Bank, Miami, FL					X	CPCS	MVS
Southern National Bank, Houston		X				DOSCK	DOS/VSE
State Street Bank, Boston	X	X		X		"In-House"	MVS
Summit and Elizabeth Bank, Summit, N.J.			X		X	UCC	DOS/VSE
Sunbanks of Florida, Orlando		X	X			CPCS	MVS
Texas Commerce Bank, Houston		X	X	X		CPCS	MVS
Third National Bank, Dayton	X					EDS/POD	DOS/VSE
Third National Bank, Nashville	X	X				CPCS	MVS
Unionbanc Computer Corp., L.A.	X	X				CPCS	MVS
Union National, Little Rock		X				DOSCK	DOS/VSE
Union Trust Co., Darien, Conn.	X		X			DOSCK	DOS/VSE
Union Trust Company of Maryland				X		CPCS	MVS
United American Bank, Knoxville		X				FSA/POD	MVS
United Banks Service Co., Denver	X	X	X			CPCS	MVS
United Carolina Bank, Monroe, NC		X				CPCS	MVS
United Virginia Bankshares, Richmond	X	X	X			CPCS	MVS
Valley National Bank, Phoenix	X	X				CPCS	MVS
Wells Fargo Bank, San Fran.	X	X				"In-House"	MVS
Western Bancorp Data Proc. Co., L.A.		X				CPCS	MVS
West. Bancorp Co., Salt Lake City		X				CPCS	MVS
Worthen Bank, Little Rock			X			UCC	DOS/VSE
York Bank & Trust Company, York, PA			X			UCC	DOS/VSE
Zions Data Services Co., Salt Lake City			X			UCC	MVS

As of 12/31/82
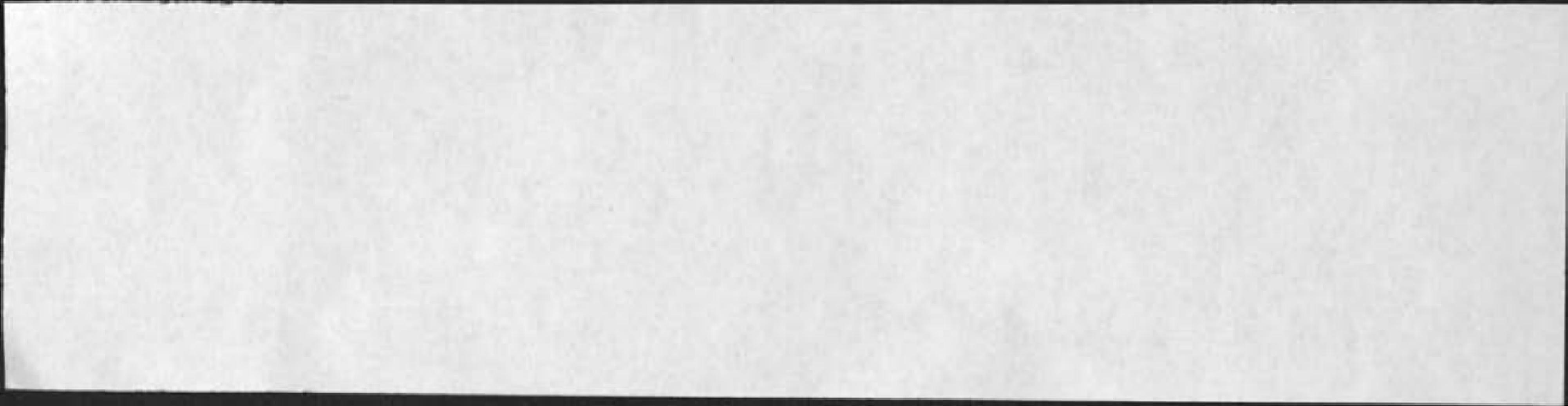
PRODUCT EVALUATION REPORT
SOFTWARE LABS, INC.

Prepared for: Sterling Software, Inc.
1001 Campbell Centre
8350 N. Central Expressway
Dallas, TX 75206

Prepared by: Burton Grad Associates, Inc.
17 North Broadway
Tarrytown, NY 10591

Burton Grad

Date: March 8, 1983

TABLE OF CONTENTS

Report Summary

Report Summary

Burton Grad Associates (BGAI) has completed its evaluation
of DMS/OS, the only current product of Software Labs, Inc.
(SLI), and of other going concern values of the company.

The product evaluation procedures followed, and the results of
this analysis, are documented in this report (Section IV) and
its appendices. Based on using the profit projection methodology,
the conclusion is that DMS/OS has a present value of $7,659,000.

The procedures and results regarding other company values are
documented in Section V. Based on these analyses, the conclusion
is that the company has an additional present value of $954,000.

This leads to our evaluation that Software Labs, Inc. has a
present value of $8,613,000.

SECTION I - OBJECTIVES

Burton Grad Associates, Inc. (BGAI) has been asked to determine
the product value for DMS/OS, the only current product of Software
Labs, Incorporated and to determine the value of the other SLI
activities.

In accordance with the stated objectives, BGAI has used its knowledge
of similar software products to prepare product revenue, cost and
profit projections for DMS/OS; it has used its experience performing
valuation studies of other software companies to establish the
value of the other business activities.

SECTION II - DESCRIPTION OF COMPANY AND PRODUCT

A. The Company

    Software Labs, Inc. is a spin-off of Application Development
    Systems, Inc. It was incorporated in July 1982 as a wholly-
    owned subsidiary of Sterling Software. Its only product is
    DMS/OS, developed by ADS in 1977.

    All marketing of DMS/OS is handled through an exclusive per-
    petual marketing agreement with Software Module Marketing, Inc.
    SLI provides ongoing enhancement and maintenance support for
    the installed base of SMM's DMS/OS customers.

    The company is headed by Jim Johnson, President, who was an
    officer of ADS before the spin-off. SLI is located in San
    Bernardino, California.

B. The Product

    DMS/OS is a direct access storage device (DASD) management and
    control system. It is designed to assist the user in making
    the most efficient use of the data storage space on his magnetic
    disks.

    DMS/OS consists of the basic product and several extra-cost
    options, known as "selectable units" (SUs).

    The basic product produces a series of management reports
    which aid in controlling the use of disk space, and also
    provides a facility for moving less-frequently used files
    from disk to tape, where they can be stored more economically.
    This process, along with the reciprocal process of moving
    files back to their original space, is known as archival
    and restoration. The facility can also be used for "backing-
    up" files (creating additional copies for safe-keeping).

The selectable units include a DASD space billing feature, a module to reconfigure DASD volumes, a module to allow TSO users to request archival and restoration, modules to handle VSAM clusters (a special type of file), and modules which allow DMS/OS to interface with other software (RACF, SECURE and ACF-2).

The DMS/OS system is well designed and very comprehensive. It is an extremely flexible system for data set control.

The first user of DMS/OS was Standard Oil of California in January of 1977. The basic product, as that time, was a pseudo-report generator for disk activities, reporting on historical data. Standard Oil provided the incentive to ADS for product evolution through their additional needs and requirements.

In mid-1977 ADS added capability for use with TSO Command Processors, and later compression capabilities. Late in 1977 the company announced a billing feature, as an "extra cost" item. Next came user exits to sophisticated job accounting systems, followed by VSAM support; early in 1981 ADS started interfacing with various security systems, such as IBM's RACF, Boole & Baggage's SECURE and Cambridge SKK's ACF-2. All these are presently offered as extra cost options. In early 1983 SLI produced an SPF interface with menu screens.

There have been five new versions and seven maintenance releases of DMS/OS since its jnception. Release 6.0 is planned for release April 1, 1983.

SECTION III - EVALUATION PLAN

A. Consultants

Burton Grad, Chairman and Chief Executive Officer of Burton
Grad Associates, Inc., has been providing strategic planning
and new business consulting to software products companies
during the past five years after eighteen years as IBM's
Director of Development for software products. He was respon-
sible for organizing the procedures to be followed in this
study and for establishing the criteria to be used. He was
also responsible for estimating marketability of the product.
Finally, he produced the study report. His biography is in
Appendix A.

B. Selection of Evaluation Methodology

A variety of asset appraisal techniques were considered,
including actual construction cost, acquisition cost for
comparable products, reconstruction costs and capitaliza-
tion of the projected profit stream. A short description
of each of these is found in Appendix B.

° There is insufficient current data relating to the
   development of DMS/OS to produce a satisfactory
   analysis of actual construction costs.

° Comparable acquisition cost for DMS/OS is difficult
   to measure since there are no direct analogies with
   other products acquired within the past year working
   under similar operating systems and equipment.

° Reconstruction cost could theoretically be used, but
   it would not be the preferred approach, since the
   method does not take into account the value of the
   large customer base - a significant asset in this
   case.

° Present value of the projected profit stream appears
   to be the most reasonable methodology. DMS/OS has
   been established in the marketplace long enough for
   there to be sufficient logic to prepare the sales
   forecasts and cost estimates which are required.

We have chosen to use the present value of the projected profit
stream methodology.

The evaluation procedures used for the other business activities
are explained in the discussion of each of these factors in
Section V.

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SECTION IV - PROCEDURES AND RESULTS - DMS/OS

There are six primary steps in determining the net present value
of the projected profit to be earned by DMS/OS:

(A)   Establish the available market opportunity

(B)   Prepare product unit forcasts

(C)   Estimate gross revenues and royalties generated by DMS/OS.

(D)   Estimate operating costs and calculate pre-tax profits.

(E)   Compute net present value with adjustment for tax liability.

A.   Available Market Potential

        The DMS/OS market consists of IBM OS installations for
        computers in the 4300, 303x, 308x and 370 range, as well
        as "plug compatible" installations such as FA/COM, Siemens
        or Amdahl. The determining marketing factor does not appear
        to be the size of the installation, since the product's
        relative low cost would make it attractive to most prospects.
        The DP manager's realization that DASD resources require
        special management techniques appears to be a more important
        marketing constraint.

        SLI has estimated the market to be approximately 8,000
        installations. This is consistent with industry estimates.
        As of 12/31/82 there were currently 507 DMS/OS users world-
        wide, of which 397 are in the U.S. and 110 are international
        customers. For purposes of this study, we have assumed that
        there are approximately 1,300 installations utilizing one
        or more of the non-IBM products. We were not able to obtain
        the number of HSM users.

        As indicated above, the number of potential DMS/OS users is
        not easily determined and therefore market penetration cannot
        be accurately estimated. However, based on 8,000 potential
        users and 1,300 non-IBM users, SLI, with 520 users, would
        have about a 40% market share of the non-IBM current market,
        and 6% of the total potential market. Since no figures are
        available for installed HSM units, we were unable to determine
        SLI's share of the total installed market.

B.   Product Unit Forecasts

DMS/OS may be sold as the basic product alone or with
"selectable units" (SUs).   The SUs may also be purchased
separately by those who already have the basic product.
Accordingly, we have estimated unit forecasts for the base
product and the selectable units separately.

There are four key unit sales measures: new sales of the
Basic DMS/OS product which includes a charge for the first
year of maintenance (called Basic-New Sales);   sales of
one or more Selectable units along with a Basic DMS/OS new
sale (called SU-New Sales); sales of one or more Selectable
Units as a follow-on to a previous Basic DMS/OS sales
(called SU-Additional Sales); maintenance contracts for the
Basic DMS/OS product and for the installed selectable units
(called Maintenance).   These unit sales are achieved in
three markets: US Domestic(called Domestic), United Kingdom
and Germany (called Foreign-UK/G); other non-U.S. (called
Foreign-Other).

To construct a unit forecast we have analyzed the underlying
IBM and plug-compatible OS type operating systems projections,
examined competitive positions and trends, and then reviewed
DMS/OS' historic trends in new sales of the Basic product and
SU's, additional sales of SU's and maintenance contracts
closed.

We believe that 1982 was a relatively weak year because of
the severe recession in the U.S. which resulted in purchase
deferrals on hardware and systems software.   This has been
factored into the projected growth rate of the Basic DMS/OS
product.   Since new sales of the Basic product are the
driving force we have used the same growth rate for new
sales of SU's.

SU's seem to be based on the "inventory" of installed Basic
products plus the availability of new attractive SU's
which were not sold along with the new product sale.

Maintenance contract sales have been almost automatic;
(98% of all systems ever installed are still on active
maintenance); the only foreign-other loss was in Iran
when the location was destroyed during the Iran/Iraq
conflict.

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The Product Unit, Revenue and Royalty sales history is shown for
1977-1982 in Appendix C. The unit data is listed below:

	1977	1978	1979	1980	1981	1982	Total
Basic - New Sales							
Domestic	29	44	53	74	100	97	397
Foreign-UK/G	-	1	5	4	10	15	35
Foreign-Other	-	1	6	17	20	31	75
Total	29	46	64	95	130	143	507
Cumulative	29	75	139	234	364	507	
Selectable Units - New Sales							
Domestic	54	77	127	179	284	312	1033
Foreign-UK/G	-	4	10	6	18	42	80
Foreign-Other	-	4	9	38	44	80	175
Total	54	85	146	223	346	434	1288
Selectable Units - Additional Sales							
Domestic	0	2	16	10	39	86	153
Foreign-UK/G	-	0	0	1	4	7	12
Foreign-Other	-	0	0	0	7	3	10
Total	0	2	16	11	50	96	175
Maintenance							
Domestic	0	29	71	124	197	294	715*
Foreign-UK/G	-	0	1	6	10	20	37*
Foreign-Other	-	0	1	6	23	43	73*
Total	0	29	73	136	230	357	825*

*Since these contracts are for a single year of maintenance, the
 aggregated total only represents the number of annual contracts
 written.

The explicit assumptions are as follows:

1) <u>Basic New Sales - Domestic:</u>

Average compound growth rate over the past 5 years has been
27.5%. We will project sales on the following basis:

          120% sales in 1983 over 1982
          110% sales in 1984 over 1983
          100% sales in 1985 over 1984
           90% sales in 1986 over 1985
           80% sales in 1987 over 1986

2) <u>Basic New Sales - Foreign-UK/G and Other:</u>

The combined growth rate has been 60% per year over past three
years. Also the non-U.S. use of advanced systems facilities
tends to lag U.S. use by approximately 2 years. We will there-
fore project sales for both on the following basis:

          140% sales in 1983 over 1982
          130% sales in 1984 over 1983
          120% sales in 1985 over 1984
          110% sales in 1986 over 1985
          100% sales in 1987 over 1986

3) <u>Selectable Units - New Sales - Domestic and Foreign:</u>

The number over the past four years of selectable units sold
along with a new sale of the Basic DMS/OS product has steadily
climbed from 2.28 to 3.03; this covers the total for Domestic
and all Foreign sales. There does not appear to be any
significant difference between the Domestic and Foreign ratios.
The higher ratio is probably accounted for by the increase in
the number of SU's available.

While we recognize that not all customers buy one or more SU's
it seems consistent to assume that this ratio levels off at
3 SU's sold for each Basic new product sale.

4) <u>Selectable Units - Additional Sales - Domestic and Foreign:</u>

While there has been .4 of a Selectable unit sold for each new
system sale over the past 4 years, it seems more logical to
base this ratio on the number sold per installed system as of
the beginning of the year. This yields an average of .21 per
installed system over the past four years. We will assume a
continuing ratio of 20 SU's sold for each 100 total installed
Basic products.

5) <u>Maintenance - Basic and SU's; Domestic and Foreign:</u>

The track record on renewing maintenance agreements is so
consistent that we have assumed that 98% of all installations
including those systems installed 1 year or less will renew
their maintenance contracts.

The following are the Product Unit Sales Projections computed using the preceding assumptions:

	1983	1984	1985	1986	1987
Basic - New Sales					
Domestic	116	128	128	115	92
Foreign - UK/G	21	27	33	36	36
Foreign - Other	43	56	68	74	74
Total	180	211	229	225	202
Cumulative (1982=507)	687	898	1127	1352	1554
Selectable Units - New Sales					
Domestic	348	384	384	345	276
Foreign - UK/G	63	81	99	108	108
Foreign - Other	129	168	204	222	222
Total	540	633	687	675	606
Selectable Units - Additional Sales					
Domestic	79	103	128	154	177
Foreign - UK/G	7	11	17	23	30
Foreign - Other	15	24	35	48	63
Total	101	138	180	225	270
Maintenance					
Domestic	383	489	605	718	816
Foreign - UK/G	34	54	79	110	143
Foreign - Other	73	114	167	230	300
Total	490	657	851	1058	1259

C. Revenue and Royalty Estimates

The price for each of the offerings was established as of January 1, 1983:

Product	Domestic Sale Price	Last Increase	Foreign Sales Price
Basic	$12,000	1/79	$15,000
SU's			
VSAM	4,000	1/83	5,000
VOL	4,000	1/83	3,750
TSO	2,500	1/83	3,000
Billing	2,500	1/83	3,000
RACF	2,500	5/81	3,000
ACF2	2,500	5/82	3,000

Maintenance

15% of current sale price for Basic and all SU's. Last increase was in 1/80.

Prices have never been increased for foreign sales. Price History is shown in Appendix D.

1. Basic - New Sales Domestic:

Discounts are a relatively small factor on new sales with approximately 27% of all domestic systems sold over the past four years, yielding an average discount of 25%. Based on the history which shows that this discount structure appears stable, we will use $11,200 as the purchase price for a new Domestic Basic product.

2. Basic - New Sales - Foreign:

On foreign sales only 16% of all units have the 25% discount. This yields an effective price of $14,400 for non-U. S. new product sales [($15,000 x .16 x .75) + ($15,000 x .84 x 1.0)].

3. Selectable Units - New Sales and Additional Sales - Domestic:

Appendix E shows the number of installed units for each of the SUs as of 12/31/82. Historically VSAM and Volume Configuration have accounted for 1.61 units per Basic Unit; TSO and billing have been 1.07 units per Basic Unit; RACF and ACF2 have been .3 units per Basic Unit sold. This has produced an average price per SU unit of $2,150 over the past four years. With the 1/1/83 price increases and assessing the same mix of SUs, the effective price per SU will be $3,300 which is the figure that will be used for Domestic SU revenue calculation.

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4. Selectable Units - New Sales and Additional Sales -
    Foreign:

    Appendix E shows the foreign installed unit mix. Based
    on current foreign prices which have been in effect since
    the products were first introduced, the effective price
    per SU is $3,800 which will be used for Foreign SU revenue
    calculation.

5. Maintenance - Basic Product and SUs - Domestic:

    The maintenance charge on new installed systems is 15%
    of current sales price (which of course includes first
    year maintenance). However, one must note that the in-
    stalled systems have fewer SUs on the average than the
    new systems, and some of the existing contracts still
    call for 10% or 12% maintenance charges, and some are
    still based on original sales price.

    Three factors determine the maintenance revenue:

    ° the number of Basic product units actually on
       maintenance contract

    ° the number of SU units actually on maintenance
       contract (if the Basic product is on, the SUs
       are on)

    ° the current effective price for the installed mix
       of Basic product and SUs

    The intermix of these factors is quite complex so that
    it appears most efficient to break the calculations down
    into two segments: (1) a revenue stream based on in-
    stallations made prior to 1982 (represented by 1982 main-
    tenance contracts); (2) a revenue stream based on future
    sales of the Basic Product and SUs.

    The effective annual revenue per maintenance contract
    (for so-called "old" systems - e.g., 1981 or earlier
    installs) will be $2,600 adjusting the 1982 average of
    $2,250 for the SU price increase which was charged on
    1/1/83.

    The effective annual revenue for "new" maintenance
    contracts (covering 1982 and later installs) will be
    $3,700. This not only recognizes the SU price increase,
    but also integrates the sale of additional SUs as well
    as the increased number of SUs which are being sold
    per Basic Product sale.

6.   Maintenance - Basic Product and SUs - Foreign:

The maintenance charges are similar for Foreign Sales
as for Domestic Sales -- 15% of current prices. Since
there have not been any price changes, we have used
the 1982 maintenance cost per contract for "old"
installations (1982 or earlier) which is $3,100.

We have then used the 1982 revenue for Basic Product
new sales and selectable unit new and additional sales
as a projection for the future mix. This yields an
effective price of $25.4K per product unit, hence a
revenue of $3,750 per maintenance contract.

Revenue Projections

U. S. and foreign Revenue History (from Appendix C) is
summarized below for reference purposes:

(K$)	1977	1978	1979	1980	1981	1982	Total
Basis - New Sales	262	449	764	1152	1512	1746	5885
Selectable Units - New and Additional Sales	26	182	363	565	976	1389	3501
Subtotal - Sales	288	631	1127	1717	2488	3135	9386
Maintenance	0	28	93	227	502	858	1708
	288	659	1220	1944	2990	3993	11094

The Revenue Estimates for DMS/OS are:

(K$)	1983	1984	1985	1986	1987	Total
Basic - New Sales						
Domestic (11.2K)	1299	1434	1434	1288	1030	6485
Foreign-UK/G (14.4K)	302	389	475	518	518	2202
Foreign-Other (14.4K)	619	806	979	1066	1066	4536
Total	2220	2629	2888	2872	2614	13223
Selectable Units-New and Additional Sales						
Domestic (3.3K)	1409	1607	1690	1647	1495	7848
Foreign-UK/G (3.8K)	266	350	441	498	524	2079
Foreign-Other (3.8K)	547	730	908	1026	1083	4294
Total	2222	2687	3039	3171	3102	14221
Maintenance						
Domestic						
Old (2.6K)	749	733	718	702	686	3588
New (3.7K)	352	766	1217	1658	2042	6035
Total	1101	1499	1935	2360	2728	9623
Foreign-UK/G						
Old (3.1K)	59	56	53	50	47	265
New (3.75K)	56	135	233	353	480	1257
Total	115	191	286	403	527	1522
Foreign-Other						
Old (3.1K)	130	127	124	121	118	620
New (3.75K)	116	274	476	716	983	2565
Total	246	401	600	837	1101	3185
Total	1462	2091	2821	3600	4356	14330
Grand Total	5904	7407	8748	9643	10072	41774

Note: Calculations of revenue do not include any future price
increases or decreases and no consideration for inflation
or changes in the relative value of U. S. and foreign
currencies.

Royalty Calculations

Since DMS/OS is sold exclusively by an outside marketing agent
(Software Module Marketing, Inc.), SLI only receives royalties
from new sales and maintenance contracts, according to the
following formula:

New Sales (Basic Product and Selectable Units)

U.S., U.K. and Germany	26.25% of gross sales price
Other	23.25% of gross sales price

Maintenance Fees

U.S., U.K. and Germany	90% of gross fee
Other	70% of gross fee

Note: The percentage calculation for new sales is based on
the contract between SMM and SLI where SLI receives 15%
of new sales value and either 90% or 70% of maintenance
revenue. However, the "purchase" price includes one
year of "free" maintenance which is considered to be
15% of the "purchase price." Therefore, the effective
percentage of royalty on new sales (Basic Product and
Selectable Units) is (.85 x .15) + (.15 x .9)= 26.25%
for U. S., U. K. and Germany, and (.85 x .15) + (.15 x .7)
= 23.25% for other foreign countries.

The royalty estimates for DMS/OS are:

(K$)	1983	1984	1985	1986	1987	Total
Basic - New Sales						
Domestic	341	376	376	338	270	1701
Foreign-UK/G	79	102	125	136	136	578
Foreign-Other	144	187	228	248	258	1055
Total	564	665	729	722	654	3334
Selectable Units-New and Additional Units						
Domestic	370	422	444	432	392	2060
Foreign-UK/G	70	92	116	131	138	547
Foreign-Other	127	170	211	239	252	999
Total	567	684	771	802	782	3606
Maintenance						
Domestic	991	1349	1741	2124	2455	8660
Foreign-UK/G	103	172	257	363	474	1369
Foreign-Other	172	281	420	586	771	2230
Total	1266	1802	2418	3073	3700	12259
Grand Total	2397	3151	3918	4597	5136	19199

D.   Operating Costs and Pre-tax Profits

The next step is to determine the operating costs required to
support SLI's projected royalty revenues. Since SLI does not
have any direct marketing or sales expense, it has an unusually
low operating cost ratio as compared to full-function systems
software companies; remember though that these costs are com-
pared to a royalty stream not to a customer revenue stream.

Another key factor is the relative maturity of DMS/OS with sub-
stantial maintenance revenues; this situation obviously requires
less technical costs than a new product with major revisions
and corrections.

Appendix F shows the cost details. For our purposes, we will
use operating costs only, and will include the current level of
R&D as necessary to maintain product marketability over the
five-year period. We will exclude both depreciation (amor-
tization of DMS/OS value is the principal element) and interest
charges (which is considered a capital expense and not an
operating cost).

There is no separate history of DMS/OS operating expenses
prior to 7/82 since they were inbedded in the ADS business
results. Therefore, we have used the last eight months as the
basis for the cost projections. The operating costs (as shown
in Appendix F) are composed of three elements (% is shown for
costs to royalties):

°   Management and Administration (M & A)   7%

°   Maintenance and Support (M & S)   15%

°   Research and Development (R & D)   24%
                                            46%

From a functional viewpoint, the operating costs of a develop-
ment organization are primarily oriented toward:

1)Maintenance and Support (M & S)

°   Correction of errors,

°   Maintaining currency with equipment and operating systems
    software charges,

°   Improving performance,

°   Adding functions or usability features.

1)Research and Development (R & D)

°   Providing new separately priced enhancements (e.g.,
    selectable units in SLI's terminology),

° Designing and producing replacement products,

° Designing and producing new products to expand market opportunities.

Therefore, it is reasonable to conclude that the level of R&D expense will be related to the royalties from new and additional sales of the Basic Product and Selectable Units while the M&S expense will be related to the maintenance royalties.

The forecast for SLI's future royalties from DMS/OS does not assume the introduction of any new products or the replacement of the current Basic Product or SUs. Therefore, the "research and development" expenses assigned to DMS/OS can be assumed to remain constant (or even decline) over the forecast period. Therefore, the DMS/OS R&D expenses have been projected as a declining percentage over the new sales period (1983-1987) and disappearing entirely during the maintenance only period (1988-1992). Note that this does not mean that there will be no other R&D expenses, but rather that these R&D expenses will be directed toward new products which will have their own revenue, royalty and profit streams (See Section V).

While maintenance and support costs will continue to grow over the new sales period (1983-1987), the increase will be less than the current ratio. Experience with many companies clearly points out the relative economics of scale for maintenance efforts; neither the larger number of contracts nor the greater maintenance revenue causes a proportional increase in M&S expenses.

Management and Administration costs would be expected to stay in line with total royalties.

With this background and our consistent assumption to omit consideration of inflationary factors which would change prices and costs, we have determined the operating costs corresponding to the projected royalties as shown below (the calculation details are covered in Appendix G):

(K$)	1983	1984	1985	1986	1987	Total
Royalty Income	2397	3151	3918	4597	5136	19199
Operating Costs	926	1054	1146	1097	1026	5249
Pre-tax Profit	1471	2097	2772	3500	4110	13950

E. Net Present Value

The final step is to compute the net present value of the
profit stream for DMS/OS royalties. While one can debate
the correct figure to use for cost of money (opportunity cost,
current prime rate, projected prime rate, current earnings
percentage, etc), we have assumed a pre-tax rate of 12 per-
cent and an after-tax rate of 6 percent. All calculations
are based on the use of 6 percent after-tax cost of money
adjusted to the income being available at the mid-point of
each year.

The following table shows the present value of the future
profit, after tax considerations, for both the products
and the maintenance contracts:

(K$)	1983	1984	1985	1986	1987	Total
(A) Pre-tax Profit	1471	2097	2772	3500	4110	13950
(B) Product Amorti- zation (882K over 4.5 years)	196	196	196	196	98	882
(C) Profit for tax calc.(A-C)	1275	1901	2576	3304	4012	13068
(D) Taxes (50% of C)	637	951	1288	1652	2006	6534
(E) Profit after tax (A-D)	834	1146	1484	1848	2104	7416
(F) Present value ratios (6% rate)	.972	.917	.865	.816	.770	
(G) Present value (E x F)	811	1051	1284	1508	1620	6274

There is one more substantial factor which needs to be included
in the present value of the DMS/OS product line. While we have
assumed no additional new product or selectable unit sales
beyond 1987, it is clear that the installed systems will
represent a considerable potential value at that time. Based
on experience with similar successful systems products,
customers will want to insure that they have long-term main-
tenance (e.g., correction of errors and currency with hardware
and software changes) for these products. We believe that
at the end of 1987, a five-year maintenance agreement could
be sold to the majority of the then current installed active
users (e.g., those on maintenance) at a special price.
Specifically, we would calculate this value as follows (see
Appendix G for detailed calculation):

° The expected maintenance royalty for 1988-1992 to be paid in 1988 would be $6,937K.

° Operating costs would be assumed to be 45% or $3,122K.

° Pre-tax profit would be $3,815K.

° Taxes would be $1,908K and after-tax profit $1,907K.

° The present value would be $1,385K (.726 x $1,907K).

When we add this to the present value of profits during 1983-1987, we get a total value of $7,659K, which is our projection of the current value of the DMS/OS product line to Software Labs, Inc.

SECTION V - VALUATION OF OTHER COMPANY ACTIVITIES

Software Labs, Inc. has a number of other business activities which
contribute to its value as a going concern in addition to the profit
projections from its DMS/OS product line.

Specifically, the following activities and elements will be eval-
uated:

° Technical staff

° New product potential from past and future R&D investment

° Revenues from other sources

    - contract work
    - educational workshops
    - documentation sales

° Potential revenues from sale of excess 4341 capacity

The value of option to purchase Software Module Marketing, Inc. and
the value of option to purchase Dylakor, Inc. will not be included
in this evaluation.

Technical Staff

SLI has eleven experienced software professionals on board, each
of whom have been recruited and are now well-trained in not only
the DMS/OS product line, but also in IBM's Operating System tech-
nology including the most recent announcements and deliveries
(e.g., MVS/XA). Since there continues to be a shortage of skilled
and experienced systems software analysts and programmers, we be-
lieve that the availability of such a group contributes a tangible
value to the company. Current average salary is $33,000 per year
per employee, and the expected training period for a new employee
would be three to six months. Recruiting fees average at least
25% of the first year's salary for software specialists with this
salary level. Finally, we can reasonably expect an average working
life at SLI of at least three years based on previous employee
turnover experience.

Therefore, we would compute the value of the technical staff as:

° 11 x $33,000 x 25% = $ 90,750
   for recruiting cost to replace

° 11 x $33,000 x 33% = $119,790
   for four months of training time
   required for replacements

° Total value is $210,540

° To bring this to a present value, we will multiply
  by .972 (1st year at 6%) and then reduce the result
  by 50% for taxes. This yields $102,000.

New Product Potential

With an existing technical staff and strong profit stream, SLI
plans to invest money in the design and construction of additional
systems software products which can be marketed to both the domestic
and foreign DMS/OS customers and to other qualified prospects
through Software Module Marketing on a royalty basis similar to
the DMS/OS agreement.

Since these specific future products cannot be identified at this
time, one must project a reasonable expectation, given an antici-
pated R&D investment budget, with a realistic time lag between the
investment and any significant buildup of revenues, royalties and,
hence, profits.

Therefore, we have performed the following calculation to estimate
the potential value of new products:

° We assume an R&D investment of $200,000 in 1983, climbing
  up to $250,000 in 1984, to $300,000 in 1985 and remaining
  at that level for 1986.

° We will assume 1st product release as being made in 1985
  based on 1983-1984 investment and 2nd product release in
  1987 based on 1985-1986 investment.

° Based on certain R&D limited partnership studies and ex-
  perience by other systems software product companies, we
  can expect that an R&D investment of $100,000 can be ex-
  pected to generate a lifetime revenue (from sales and
  maintenance) of $3,000,000.

° If we assume that SMM would pay 30% royalty on this revenue
  stream, then we would have $900K royalty for each $100,000
  of product investment over the product's lifetime. With
  continuing technical costs for enhancement and maintenance,
  we can only anticipate a 30% pre-tax margin which would yield
  $270K on a $100K investment.

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° The present value would depend on the cash flow.
We will assume the following pre-tax picture:

Year 1	-40K
Year 2	-60K
Year 3	+20K
Year 4	+30K
Year 5	+40K
Year 6	+50K
Year 7	+60K
Year 8	+70K
	+170K

° Assuming direct expensing of development costs, the after-
tax profit (loss) and present value would be:

	After Tax (K$)	PV Ratio*	Present Value (K$)
Year 1	-20	.972	-19
Year 2	-30	.917	-28
Year 3	+10	.865	+ 9
Year 4	+15	.816	+12
Year 5	+20	.770	+15
Year 6	+25	.726	+18
Year 7	+30	.685	+21
Year 8	+35	.646	+23
			+51

* Present value ratio is based on
6% after-tax as cost of money.

° Therefore, for each $100,000 investment, one can expect
a net present value of $51,000.

° Since we assume that product #1 will start its investment
cycle in 1983 and have a total investment of $450,000, we
can project a present value of $229,000 (4.5 x $51K).

° Since we presume that product #2 will start its investment
cycle in 1985 and have a total investment of $600,000, we
can project a present value of $265,000 (6.0 x $51K x .865)
after adjusting for the present value of the later start.

The total present value of these two prospective new products
is $494,000.

In addition, a new SU providing menus for TSO users will be re-
leased in April 1983 based on work done in 1982. Royalty esti-
mates for this product are for 250 installations at $656 royalty
for a total of $164K. Assuming 45% operating costs, primary
sales in 1983-85 and the usual taxes and present value ratios
yields $42,000.

Revenues from Other Sources

SLI currently receives royalties from SMM for conducting workshops on DMS/OS. There have been approximately ten workshops per year with a royalty of $4,000 per workshop. Total incremental costs to SLI are estimated at less than $1,000 yielding a pre-tax profit of $30,000 per year.

SLI also sells additional documentation to DMS/OS users. This has averaged $8,000 per year. Incremental costs are estimated at approximately $3,000 yielding a pre-tax profit of $5,000 per year.

Consulting services produce $15,000 per year revenue and since incremental costs are essentially zero (people are already on the payroll and travel expenses are reimbursed), this yields a pre-tax profit of $15,000 per year.

In all these three items, currently, produce $50,000 per year pre-tax profit. Using normal tax rates and using the same present value ratios, we project that these activities will be worth $108,000 over the 1983-1987 period.

Potential Revenues from Sale of Available Machine Time

SLI must have for its own development and testing use, a relatively powerful IBM mainframe computer. At this time, they are using a 4341 group 1 which will soon be upgraded. However, which they need the capability of a powerful machine, they do not need all the available time. Therefore, they plan to sell these services on a time-sharing basis, first to other Sterling Software companies and then on a local basis in Sacramento (where there is little competition for that powerful a machine from other service bureaus).

Based on current and projected prices, we estimate a revenue of $9,000 per month for 1983-1987 with a total incremental cost of only $1,000 per month. This yields $96,000 per year pretax. Applying normal tax rates and a 6% after-tax present value ratio, this would yield a total of $208,000 over the five-year period.

PROFESSIONAL SUMMARY -- BURTON GRAD

Burton Grad, President of Burton Grad Associates, Inc., has a
long record of significant contributions to data processing. He
has experience as user and developer of application systems and
as author, speaker, innovator, businessman and industry leader
in the computer software and services industry.

* four years as private consultant for software products,
   software professional services, information processing
   and computer equipment businesses

   --strategic planning, management consulting and
      product analysis and review

   --assisting executives to plan more effectively and
      manage their current and long-range activities

   --work performed individually or with assistance of
      internationally-known specialists in market research,
      graphics, mini and micro applications and computer
      programming

   --list of clients (partial):

                  Advanced Computer Techniques
                  AGS Computers, Inc.
                  Argonaut Information Systems
                  Atlantic Management Systems, Inc.
                  Boole and Babbage
                  CGA Computer Associates, Inc.
                  Honeywell Information Systems, Inc.
                  Informatics
                  Information Science
                  IBM
                  International Computer Programs
                  National CSS
                  Northern Telecom
                  Software a. g.
                  Software Design Associates
                  Syncsort
                  University Computing Co.

* eighteen years with International Business Machines:

  -- defined, designed and implemented application development systems strategy resulting in release of IBM's development management system

  -- development of application programs for every major industry

  -- establishment of joint planning and program development with European operations

  -- announcement, development and initial support of CICS

  -- management of application development for small business and process control systems

  -- responsibility for the production, release, and maintenance of close to 200 programs

  -- conception of approach to and programs for text processing office automation systems

  -- expansion of computer assisted instruction systems

  -- development of management science and scientific programs

  -- participation in the structuring and unbundling of IBM program products

  -- creation of the Study Organization Plan for specifying and designing application systems

* eleven years with General Electric Company:

  -- programming of the first commercial computer

  -- development of discrete simulation techniques for manufacturing planning and control

  -- invention of decision tables

  -- study of automatic factory design

  -- initiation and use of advanced techniques for production, inventory and quality control

* over twenty-five years communicating the principles and
   concepts of information processing systems:

   -- co-author of <u>Management Systems</u>, published in 1968
      and republished in 1979 by Holt, Rinehart and Winston,
      used in many colleges to train industrial engineers
      and business management students. The book has been
      translated into Japanese and Spanish.

   -- President of Software Industries Association

   -- board member of ADAPSO, the computer services trade
      association; active participant in Industry Relations
      Committee

   -- early member of CODASYL standards committee which
      defined DETAB-X

   -- speaker at various conferences and contributor to
      professional and trade journals on information process
      charting, study organization plan, automated design
      and manufacturing engineering, decision tables, profes-
      sionalism in systems engineering and educational use
      of computers

   -- Graduate of Rensselaer Polytechnic Institute with a
      degree in Management Engineering

   -- ICCP Certificate holder

DEFINITIONS OF ASSET APPRAISAL TECHNIQUES

1.   Annual Construction Cost

      This recognizes the actual cost of building the
      program, including labor, computer time, support
      costs and an appropriate allocation of management
      and administrative charges. This does not, however,
      recognize intrinsic market value arising from the
      copyright and/or trade secret protection, nor the
      impact of inflation if the actual construction
      took place at some period prior to the present.

2.   Acquisition Cost

      This approach considers valuation patterns for
      previous sales of products or companies where the
      primary assets were similar to those being acquired.
      These patterns would include price/earnings ratios,
      projected earnings streams and the intrinsic
      uniqueness and value of the particular products.

3.   Reconstruction Cost

      This calculates the cost that an arms length
      "third party" would incur to build a current
      version of the same product. This, of course,
      takes the innovation factor into account and
      recognizes program elements that are neither in
      the public domain or generally know to the de-
      velopment community. All the elements of design,
      implementation, documentation, testing, etc. must
      be taken into consideration, together with the
      appropriate management and administrative allo-
      cations. Profit margins would not be included.

4.   Capitalization of the Projected Profit Stream

      This projects the pre-tax earnings stream for a
      product over a reasonable useful life and then
      establishes an appropriate present value for
      that future earnings stream. It is based upon
      sales forecasts for the product and the cost for
      maintaining and selling it, as well as overhead
      allocations. It also takes into account the
      time value of money.

SALES HISTORY-DMS/OS

1) <u>DOMESTIC</u>

	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>Total</u>
Basic-New Sales							
Units	29	44	53	74	100	97	397
Revenue (K$)	262	419	606	843	1095	1089	4315
Royalty (K$)	131	209	303	422	548	389	2002
# on Discount	2	4	9	19	35	25	94
Selectable Units - New Sales							
Units	54	77	127	179	284	312	1033
Revenue (K$)	26	150	261	368	600	678	2083
Royalty (K$)	13	75	131	184	300	247	950
Selectable Units - Additional Sales							
Units	0	2	16	10	39	86	153
Revenue (K$)	0	3	37	22	95	207	364
Royalty (K$)	0	2	19	11	47	75	153
Maintenance							
Units	0	29	71	124	197	294	715*
Revenue (K$)	0	28	87	196	403	665	1379
Royalty (K$)	0	20	61	137	282	534	1034

*The total number of maintenance units represents the number of annual contracts written.

2) FOREIGN -U.K. & GERMANY

	1978	1979	1980	1981	1982	Total
Basic -New Sales						
Units	1	5	4	10	15	35
Revenue (K$)	15	69	57	139	214	494
Royalty (K$)	6	28	23	56	62	174
# on Discount	0	0	1	3	3	7
Selectable Units - New Sales						
Units	4	10	6	18	42	80
Revenue (K$)	14	36	21	67	159	297
Royalty (K$)	6	14	8	27	45	101
Selectable Units - Additional Sales						
Units	0	0	1	4	7	12
Revenue (K$)	0	0	5	16	26	47
Royalty (K$)	0	0	2	6	8	16
Maintenance						
Units	0	1	6	10	20	37*
Revenue (K$)	0	3	16	31	60	110
Royalty (K$)	0	2	10	18	54	84

*The total number of maintenance units represents the number of annual contracts written.

3) FOREIGN -OTHER

	1978	1979	1980	1981	1982	Total
Basic - New Sales						
Units	1	6	17	20	31	75
Revenue (K$)	15	89	252	278	443	1077
Royalty (K$)	6	37	101	111	139	394
# on Discount	0	0	1	3	6	10
Selectable Units - New Sales						
Units	4	9	38	44	80	175
Revenue (K$)	15	29	149	172	308	673
Royalty (K$)	6	12	60	69	96	242
Selectable Units - Additional Sales						
Units	0	0	0	7	3	10
Revenue (K$)	0	0	0	26	11	36
Royalty (K$)	0	0	0	10	3	13
Maintenance						
Units	0	1	6	23	43	73*
Revenue (K$)	0	3	15	68	133	219
Royalty (K$)	0	2	9	41	91	143

*The total number of maintenance units represents the number of annual contracts written.

PRICE HISTORY

Basic Product		Domestic	Foreign (since 1978)
	1/77	$ 8,900	
	5/77	10,000	
	1/79	12,000	$15,000

Selectable Units

		Domestic	Foreign
VSAM	1/77	2,500	
	1/83	4,000	5,000
Volume	1/77	2,500	
	1/83	4,000	3,750
TSO	1/77	1,500	
	1/83	2,500	3,000
Billing	1/77	1,500	
	1/83	2,500	3,000
RACF	5/81	2,500	3,000
ACF2	5/82	2,500	3,000

NOTE 1 - On Basic Product - 25% discount for 2nd - 4th site
for same customer

- 50% discount for 5 or more sites
for same customer

NOTE 2 - No discount on selectable unit sales

NOTE 3 - No discount on maintenance charges

Maintenance

1/77 - 10% of new sale price

1/78 - 12% of new sale price

1/80 - 15% of new sale price

INSTALLED UNITS - 12/31/82

	Domestic	Foreign U. K./G	Foreign Other
Basic Product	397	35	75
Selectable Units			
VSAM	328	25	59
VOL	311	24	59
TSO	275	21	36
Billing	151	10	19
RACF	77	8	13
ACF2	43	4	1

EXPENSE HISTORY   7/82 - 2/83

(K$)	7/82- 9/82	10/82- 12/82	1/83- 2/83*	Total
Mgt & Admin	30	38	25	93
Maint & Supt	66	89	48	203
Res & Dev	112	116	84	312
Total Oper Cost	208	243	157	608
Depreciation	48	48	32	128
Interest	24	24	16	64
Total Cost	280	315	205	800
Royalty Income	404	588	327	1319
Pre-tax Profit	124	273	122	519
Oper Cost/ Royalty Ratio	.51	.41	.48	.46

* Only 2 months

Operations Cost Projections

Step 1

Calculate 1982 costs based on ratios from 7/1/82 - 2/28/83 experience:

	7/1/82-2/28/83 (K$)	% to Royalty	1/1/82-12/31/82 (K$)
Mgt & Admin	93	7.0	108
Maint & Supt	203	15.4	238
Res & Dev	312	23.7	366
Total Oper Costs	608	46.1	712
Total Royalty	1319	100.0	1545 (1)

(1) Based on actual revenues using new royalty percentages which were only in effect from 7/1/82. Actual royalties for calendar year 1982 were $1,743K. Table below shows these differences:

(K$)	Actual 1982	Computed 1982
New Sales	590	445
Selectable Units	474	355
Maintenance	679	745
Total	1743	1545

Step 2

The assumptions are:

° Management & Administration costs will increase with total royalties at 18% of other operating costs (108/604 for 1982).

° Maintenance and Support is currently 32% of maintenance revenue (238/745 for 1982). We will include the $238K as a fixed amount for the 1983-1987 period and add 16% of the maintenance revenue increase each year.

°   For the maintenance-only period (1988-1992), maintenance
    costs will stabilize at the 1987 ratio (19.2%). This
    has to be doubled to compensate for the 50% price re-
    duction and then increased by 18% ·for management and
    administration.

    The result of these adjustments is a 45% operating
    cost ratio.

°   Research and Development is currently 46% of new and
    additional sales revenue (366/800). We believe that
    the percentage will decline by 5% per year from 1983
    to 1985, then 10% a year for 1986-1987, and then be
    eliminated entirely in the maintenance-only period
    (1988-1992). Hence, the following percentages will
    be used:

1983	41%
1984	36%
1985	31%
1986	21%
1987	11%
1988 -	
1992	0%

Step 3

The Expense Projections are:

(K$)	1983	1984	1985	1986	1987	Total
Royalties						
(A) New and Add'l Sales	1131	1349	1500	1524	1436	6940
(B) Maintenance	1266	1802	2418	3073	3700	12259
(C) Total Royalties (A+B)	2397	3151	3918	4597	5136	19199
Expenses						
(D) Mgt & Adm						
(.18 x (E+F))	141	161	175	167	157	801
(E) Maint & Supt						
(238 + .16(B-1266)	321	407	506	610	711	2555
(F) Res & Devel						
(per table x A)	464	486	465	320	158	1893
(G) Total Expenses						
(D + E + F)	926	1054	1146	1097	1026	5249

Step 4

Compute operating costs for the maintenance-only period
(1988-1992).

The projected maintenance royalty is based on 1987 main-
tenance royalties. It is assumed that a 50% discount
for a five-year period would yield a 75% renewal rate.

Royalty = $3,700K x .5 x 5 x .75

= $6937K

Operating Costs = .45 x $6937K

= $3122K
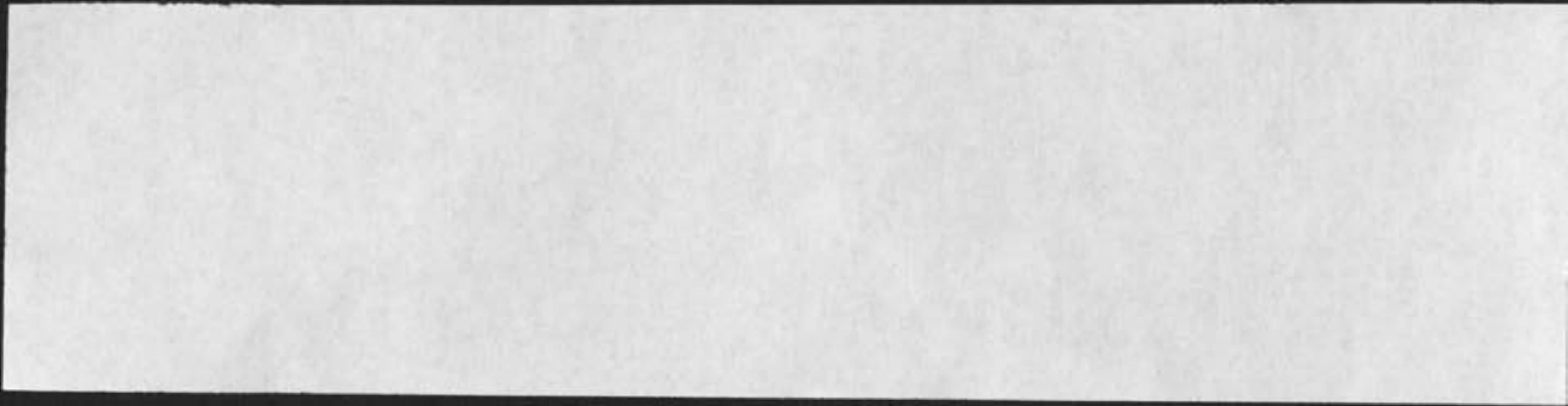
BUSINESS ANALYSIS REPORT
SOFTWARE MODULE MARKETING, INC.

Prepared For:

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Burton Grad
David Gold
Sid Dunayer

Date:

March 9, 1983

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SECTION I - THE COMPANY

A. Description and History

SMM was founded in September of 1974 for the purpose of mar-
keting packaged software obtained from product developers to
large users of IBM mainframes. The selection criteria for
the software packages included the requirements that they be
installable by the users, not need system modifications and
be suitable for use in essentially all industries. The goal,
thus, was to ship the product in the form of a tape directly
to the customers. Furthermore, the sale was supported by
shipment of the package "on approval," that is, a package
typically was mailed (with a built-in "blow-up" date, to
guard against continued long-term usage) with the expectation
that the user would either pay for it or return the tape and
documentation. The company continues to market its products
in this way today.

All current products are targeted for use by DP staff in
managing and operating their systems.

B. Financials

SMM's revenues increased from $2.2 million in fiscal 1980 to
approximately $5 million in 1982. The 1983 forecast calls
for $8 million in revenues.

Seventy-one percent of revenues are attributable to sales
and maintenance contracts from one product, DMS/OS. Sales
have increased steadily, in both dollars and units, since
the product's inception in 1977. However, gross sales appear
to be flat or slightly lower for 1982 for domestic new product
sales.

Calendar Year	Units*	Gross Sales by SMM*
1977	29	$ 288,000
1978	46	631,000
1979	64	1,127,000
1980	95	1,717,000
1981	130	2,488,000
1982	143	3,135,000
	507 total installed units	$9,386,000

* Figures are for combined domestic and foreign sales.

Maintenance revenues have grown even more rapidly and don't
appear to have peaked.

Year.	Gross Maintenance Revenue by SMM
1977	$ 0
1978	28,000
1979	93,000
1980	227,000
1981	502,000
1982	858,000
	$1,708,000

A discussion of the future prospects for this product may be
found under SECTION II - PRODUCTS/MARKETS.

The rest of SMM's revenues are evenly distributed among its
other products, with the exception of a new entry, JOL.
JOL has had success in foreign markets ($2.2 million in
sales in Australia, New Zealand and the Phillipines), and
SMM expects it to be a major contributor in 1983 and beyond.

C.   Organization and Facilities

Harris A. Herman (one of the firm's co-founders) is SMM's
President and Chairman of the Board. He has been largely
responsible for the company's philosophy and direction, as
well as the designer of the company's formula approach for
doing its marketing. An organization chart is shown as Appendix A.

Carole Murphy (Harris' wife) is Executive Vice President in charge
of day-to-day operations.

Three product managers report to Herman, each managing a
family of products, roughly defined by price. They are
Jim Kattman (High-Cost Products), Dave Swanson (Low-Cost
Products) and Mark Moore (Special Products).   Each is
responsible for customer support and training, advertising
and promotion, and sales for their entire product line.

The company also has a separate department to handle adver-
tising and promotion.

Other key individuals include Don Murphy, responsible for
Foreign Operations and Market Research and Bill Zollner, Chief Fin-
cial Officer. Biographies of several key people may be found
in Appendix B.

The company's main headquarters are in Sacramento, California,
SMM's largest marketing and support location. In addition,
the firm has sales and support offices in Dusseldorf, Germany,
and London, England. Additional marketing coverage is handled
by agents located in France, Italy, Australia, Scandinavia,
Japan, South Africa, Israel, Venezuela and the Benelux area.

D. Business Structure

The business is currently viewed as consisting of three product "families," based primarily on the price of the product:

- High-cost products (over $10,000). These include DMS/OS, the DSM group and ESP/DJC

- Low-cost products (under $10,000), including TRACS, PMO, FASTCOPY, QUICKTUBE and HOTREADER

- Special products, restricted to JOL

SMM feels that they do not have any significant direct competitors except for the Shared Device products. The sales issue seems to be primarily whether or not the benefits of the particular product are evident and necessary to a given installation. JOL, however, constitutes a special situation since it requires a much longer selling cycle than the other products because: (a) it is relatively unique (and, hence, not well-understood); (b) it appears expensive at $80,000; and (c) it implies replacing IBM's standard product, JCL.

All current products are targeted for use by DP managers in managing and operating their systems.

SMM states that their future trend will be toward new products which will be sold on relatively smaller systems (including DOS and the IBM Personal Computer and Apple microcomputer) and products which provide communications between large mainframes and small systems - this being the general direction in the industry. Again, SMM intends to continue to market directly to DP managers in large user shops and thus expects to exploit its reputation and credibility as these large users begin more and more to use multiple smaller systems in a distributed processing environment.

While continued product development may be done by SMM, it is usually performed by the original product developers. Thus, ongoing training-type support (which is done by SMM, along with fault isolation and confirmation) is typically separated from the actual fault correction and ongoing product enhancement.

SMM markets its products through direct mail, media ads, seminars, workshops and telephone, concentrating on the large DP users of IBM mainframes; target companies are typically in the Fortune 1000 group. The company effectively trains its sales people to be highly productive very quickly. (Annualized revenue of over $500,000 after an initial six-month training period is not uncommon.) SMM is thus not dependent upon any particular salesperson.

SMM has marketing agreements with all the developers of its current products. All give them exclusive rights to sell the products except Duquesne Systems, Inc., which supplies SDM and PMO. The developers have no cancellation option unless SMM fails to meet specified quotas.

SECTION II - THE PRODUCTS/MARKETS

A. DMS/OS

Technical Description

DMS/OS is a direct access storage device (DASD) management and Control system obtained from Software Labs, Inc. (SLI). It is designed to assist the user in realizing the maximum benefit from his DASD volumes. This goal is accomplished through a series of management reports and the migration of data sets from the primary DASD volume to a secondary media, usually tape. DMS/OS also provides for archival storage and restoration of data, as well as for incremental back-up. These functions can be performed automatically or under control of the user. Optional "extra cost" features of DMS/OS allow it to: perform DASD space billing; reconfigure DASD volumes; support TSO user requests for archival and restoration; interface with RACF, SECURE and ACF-2; and handle VSAM clusters.

The DMS/OS system is well-designed and very comprehensive. It is an extremely flexible system for data set control.

Competition

The primary competitors to DMS/OS - IBM's Hierarchical Storage Manager (HSM), Cambridge Systems Group's Automated Storage Management System (ASM2), and University Computing Company's UCC-3. All provide similar functions. Although IBM's HSM does not have a formal report component or a Volume Configuration function, it has a competitive advantage in that it allows for the automatic restoration of archived data without user intervention. This is often an important feature, in that it eliminates some of the manpower required to handle requests for archived data.

Cambridge System Group's ASM2 is packaged in a bundled configuration (i.e. no selectable units) which makes installation easier. The ASM2 command language is powerful and easy to use. This is a different approach to the table system used by DMS/OS. ASM2 also has standard interfaces to popular security systems and tape management systems bundled into the basic system.

UCC-3 was found to contain similar functions to DMS/OS but these functions were not as comprehensive as those in DMS/OS. This would make DMS/OS a better choice than UCC-3.

A fourth competitor is a combination of FDR/ADR/Compactor, three independent products marketed by Innovation Systems, which when combined, perform functions similar to DMS/OS. FDR and ADR are principally back-up systems. Compactor is a compressor program. There are approximately four thousand FDR users in the field, but this is considered a plus for DMS/OS marketing efforts since DMS/OS is a natural extension to these offerings.

II-1

DMS/OS reports contain support to allow bringing a data set
back to its current level after a complete DASD volume is re-
covered, presumably after a hardware failure, by combining
a full-volume restore from the FDR package from Innovation
Systems   with a restore of the latest incremental
back-up of the data set produced by DMS/OS. This function
is comparable to that provided by HSM and IBM's DF/DSS pack-
age. It should be noted that DF/DSS contains a volume defrag-
mentation function similar to that provided by DMS/OS. Bench-
marks of FDR and DF/DSS, both of which perform similar func-
tions, have shown that DF/DSS tends to have faster performance.

SLI has already tested and proven the compatibility of DMS/OS
with IBM's new MVS/XA operating system. It is doubtful that
UCC-3 or ASM-2 can run under MVS/XA without significant re-
programming.

As the cost per megabyte of DASD storage decreases and the
data transfer rate increases, the need for formal reporting
and billing systems may be de-emphasized. The archiving and
restoration of data, however, will become more important as
more data is stored and as more and more industries are re-
quired to maintain data for longer periods of time.

If DMS/OS is to maintain its position, or perhaps even to
improve it, it is important that an automatic restoration
function be implemented. Interfaces to other security
systems, as well as interfaces to the popular tape manage-
ment systems, should also be implemented. It might also
be desirable to include VSAM in the basic package.

Market Definition and Penetration

DMS/OS functions exclusively under OS or OS/VS. There are cur-
rently 520 DMS/OS users world-wide, of which 420 are in the
U. S. and 100 are international customers. There are approxi-
mately 300 ASM-2 users and 230 UCC-3 users, but we could not
estimate the number of IBM's HSM users. For purposes of this
study, we have assumed that there are approximately 1,300 in-
stallations utilizing one or more of the non-IBM products.
The product developer estimated the total domestic market to
be approximately 8,000 sites.

The current price for the basic system is $12,000, which
increases to $27,500 if all Selectable Units (SU's) are
included. The typical sale, at this time, is $17,500.
Effective January 1, 1983, a price increase went into
effect for the selectable units: VSAM at $4,000 each.
The SU's for Billing and TSO Command are sold at $2,500.

Risk Analysis

The major risk facing this business is market saturation for DMS/OS. However, maintenance fees and some sales should continue as long as the product is useful to the industry. Any industry change affecting the demand for disk space should increase demand.

DMS/OS runs the normal risks involved in marketing any software offerings targeted for IBM mainframes in that IBM could produce an exceptional product which eliminates or reduces the need for the function provided by DMS/OS. If this should happen, it would take one or two years to react and attempt to replace the revenues that the company is likely to lose to this "superior" product. Historically, however, IBM has not taken this approach very often.

Finally, there is a risk inherent in the age of DMS/OS (a five-year old product). The rapid evolution of the computer industry in general could shorten the product's total life.

B.   SDSI, STAM AND SUPERCONSOLE

Technical Description

This group of three products are collectively referred to as
SDM, Shared Device Management.

Shared Dataset Integrity (SDSI), Shared Tape Allocation Man-
ager (STAM) and Superconsole (SCON) are designed to benefit
the user with multiple independent CPUs that share common re-
sources by making the systems behave as if they were physically
one system. These products may be used individually or in any
combination to allow control of the respective functions.

SDSI is designed to protect disk datasets from simultaneous up-
dates by multiple systems without the use of a hardware "re-
serve" instruction. The benefit of this scheme is to improve
system performance. SDSI can also be used to guarantee integ-
rity to any resource, not just disk datasets. It also has
facilities to notify users of resource conflicts. The hand-
off information between systems is via a small shared disk data-
set.

STAM is designed to manage shared mountable devices, both tape
and disk, in such a manner that the status of each device is
known in all sharing systems.

For tape drives, STAM prevents the operator from accidentally
placing the device on-line to different systems simultaneously.
For disk drives, STAM makes a mounted volume known to all sys-
tems so that a dismount will not be allowed until the device
is no longer needed. Communications between systems is
through a shared disk dataset.

SCON is designed to allow multiple systems to be operated from
a series of consoles on one of the systems. This is attractive
in that it can eliminate the need for multiple, one per system,
"pool" consoles. Communication between systems is via a small
shared disk dataset.

Competition

SDM has two competitors:

° CGA (formerly Allen Services) with MSI, MSM and Global
   Console.

° IBM whose solution combines hardware and software techniques
   and is clearly more expensive than the software-only approach-
   es.

Customer Acceptance

Four users of SDSI and/or STAM were contacted. They all agreed
that the product performed well and both documentation and
vendor technical support was good. The decision for choosing

these products over their competitors was strictly on a "we heard about this one first" basis. One user of SDSI indicated that his installation would be eliminating the use of SDSI in favor of IBM's GRS, a part of the MVS/SP3 Operating System. SDSI performs intersystem communication via a shared disk dataset, while GRS uses a hardware connection known as a Channel-to-Channel Adapter. The change to GRS was based upon estimates that GRS would perform its function faster than SDSI and with less system overhead.

Market Definition, Penetration

There are approximately 1,500 to 1,700 multiple CPU MVS sites in the U. S. Although SMM's 100 customers account for more than 100 sites, they still probably represent no more than ten percent of the market. Furthermore, there is an additional market opportunity from:

° non-U.S. sites (perhaps 50 percent of the U.S. potential)

° migration to MVS from other systems, and

° growth to multiple CPUs in currently single CPU MVS shops (possibly 2,000-3,000 candidate locations).

The product unit prices are (with discounts avilable for multiple unit sales):

SDSI	$ 12,000
STAM	10,000
SUPERCONSOLE	7,500

Risk Analysis

The SDM products were developed by Duquesne Systems, Inc. and, along with PMO, are the only products for which SMM does not have an exclusive sales license. As a result, there is some risk that SMM's sales force will not be motivated to sell Duquesne's products relative to others for which they have world-wide exclusive rights.

The major difference between the SDM products and their counterparts from CGA is the packaging: CGA packages their products to operate as a single logical job using a common shared disk dataset that is managed by a single component known as MSX. SDSI, STAM and SCON are packaged as independent jobs with independent data sets for each product. The primary concern with the multi-job independent approach is that there is more operating system overhead.

C. ESP/DJC

Technical Description

ESP/DJC is a modification to the IBM JES2 component of MVS
that provides the "job networking" function, supplied by
IBM as a standard function in JES3. "Job networking" is
a mechanism that allows the user to submit a series of jobs
that must be executed in a specific order and have the sys-
tem automatically control their execution. Without this
facility, these jobs must be submitted one at a time, or
released manually by the console operator. The installa-
tion procedure is designed to be simple and documentation
is very good.

Competition

SMM indicates that this product has no competitors.

Market Definition and Penetration

This is a relatively new product, which the company has been
marketing for only six months. There are four systems in-
stalled although the company forecasts a few dozen sales in
fiscal 1983.

The total potential market for ESP/DJC consists of all JES2
installations which we estimate number over two thousand.
Current migration of JES2 to JES3 is minimal, thus maintain-
ing a favorable market for ESP/DJC.

ESP/DJC sells for $12,000 for a single system and $19,000 for
a two CPU system. A Job Submission Option brings the total
price into the $20,000 range.

Risk Analysis

If IBM forces migration to JES3 from JES2 by refusing to sup-
port the latter product, the market for ESP/DJC would be
affected.

An additional risk exists in that ESP/DJC is a source code
modification to JES2 and its installation could be complicated
if other concurrent user modifications to JES2 are installed.
IBM has been moving towards discouraging user modification of
JES2 source code by supplying many exits. Currently, how-
ever, these exits are not sufficient to support ESP/DJC with-
out modifications to IBM code.

D. SMM/TRACS

Technical Description

SMM/TRACS is a program designed to transmit batch data between computers and "intelligent" teleprocessing devices. It runs as a batch job under IBM's OS or DOS Operating Systems. SMM/TRACS is extremely versatile in that it can communicate with a wide variety of popular teleprocessing devices and computer systems: OS; DOS; IBM S/3; S/32; S/34; S/38; Series/1; OS6; Burroughs; Honeywell; mini and microprocessor systems as well as a large number of intelligent and non-intelligent terminals. SMM/TRACS also has the ability to simulate 2780 and 3780 devices to allow communication with a JES2 system as an RJE workstation. The communications link can be either a dedicated line or a dial-up system. All data is transmitted using the Bisync protocol.

The program and its subroutines are well documented. Program generation is very simple and requires a minimal amount of systems programming knowledge.

Competition

Although the company cannot identify any direct competitors to this product, it is clear that there are going to be a large number of other offerings which provide at least a portion of the functional capability of TRACS. Most products will probably be focused on the low end of the market (micros and minis) or will provide ad hoc (as opposed to general) solutions. But there will nevertheless be many competitors very soon.

Customer Acceptance

The four users of SMM/TRACS that were contacted were the most excited of all users in the survey. All had high praise for the product and were eager to recommend it to others. All indicated that the vendor was actively working to include new features that will make the product more versatile than it already is. Two users have replaced dedicated hardware transmission systems with this product and indicated that there was a substantial savings in both cost and manpower.

Market Definition and Penetration

The company has installed 40 systems since mid-October of 1982, when it first started selling the system. Its forecast, which SMM feels is extremely conservative, is for another 60 systems in fiscal 1983. Clearly, the penetration of this product into its total available market is minuscule, since there are more than ten thousand IBM host systems installed, many of which will require batch Bisync communication.

There will clearly be increasing requirements for communication between dissimilar devices. This product appears to be well positioned at least for the short to intermediate term.

SMM/TRACS currently sells for $5,000 (DOS) and $7,000 (OS), with a forecast of a ten to fifteen percent price increase early in 1983.

Risk Analysis

The only apparent shortcoming of SMM/TRACS is its current inability to communicate with SNA/SDLC devices. However, SNA/SDLC support is now being developed for the product.

E. PMO

Technical Description

The Program Management Optimizer (PMO) is designed to extend
IBM's Operating System (OS/MVS or OS/VS1) BLDL list function
by monitoring program load activity and keeping the most
active directory entries for LINKLIST libraries in storage.
The standard function provided by the Operating System is a
static list built by the user at initial program load (IPL)
time. The benefit of the BLDL list is that it eliminates
long directory searches each time a LINKLIST module is ac-
cessed.

PMO is the only commercial version of a program known as
"DYNAMIC BLDL" that is available from various MVS user
groups on the "MVSMODS" tape. PMO eliminates the need
for the complex installation procedure used by the MVSMODS
version. PMO also provides excellent documentation and full
technical support.

The reports produced by PMO are extremely useful in helping
to improve system performance by identifying heavily used
modules by library.

The functions provided by PMO are used to build an initial
BLDL list and to tune LINKLIST libraries. It would then be
used as needed to help keep the list current.

Competition

SMM indicates that there really is no direct competitor to
PMO. Probably the most frequently encountered competition
is the customer's own software for managing the BLDL list.

Customer Acceptance

Five users of PMO were contacted and each indicated the prod-
uct performed well. The MVS users were pleased since PMO
was easier to install and use than the "non-commercial" program
known as DYNAMIC BLDL, available from the various MVS users
groups. The VS1 users found that PMO helped to improve system
performance. They did indicate that the "Private Dataset
Option," available only in MVS, would be a desirable feature
in VS1 also.

Market Definition and Penetration

PMO runs in MVS environments, of which there are some 1,500
to 1,700 multiple CPU systems - plus another 2,000-3,000 single
system sites. The company has over 100 PMOs installed,
less than 5% of the market.
In managing the BLDL list, this product's functions are well-
received by some sales prospects, but not particularly valued
by others for whom PMO does not represent an advantage.

The product price is $5,000 for a single CPU with the average invoicing currently at $7,500 (due to multiple CPUs).

F.   SMM/FASTCOPY

Technical Description

SMM/FASTCOPY is an enhancement to IBM's IEBCOPY program for MVS and OS/VS1, designed to reduce CPU time requirements and total run time. FASTCOPY also provides a utility to "compress" all partitioned datasets on a given Direct Access Storage Device (DASD) volume, as well as a program to help manage these datasets by producing cross-reference reports indicating the contents of each one. Without FASTCOPY installed, IEBCOPY tends to require large amounts of CPU time to perform its functions.

The installation procedure is simple and gives the user the option of either replacing the IBM supplied version of IEBCOPY or creating a separate version with FASTCOPY installed. Documentation is sufficient and technical support is available.

Competition

Other than IBM's IEBCOPY, there are no competitive programs at this time.

Market Definition and Penetration

SMM/FASTCOPY runs under MVS or VS1. The product has only been sold for the last four or five months and a total of twelve have been sold so far. Although the company forecasts several dozen sales of FASTCOPY over the next year, its total market penetration clearly is minimal.

G. QUICKTUBE .

Technical Description

QUICKTUBE is an enhancement to the TSO/TCAM environment
of IBM's OS/MVT, OS/SVS and MVS operating systems, designed
to improve system performance when using Remote Bisync 3270
Display Devices and the IBM (or comparable) 270x or 370x Emu-
lator Program (EP). In the non-QUICKTUBE enbironment, TSO/
TCAM must issue an I/O instruction to solicit input (Poll)
from every terminal on a communications line. Since this
technique can place heavy demands on a CPU, a short delay
is usually inserted after all terminals have been polled.
QUICKTUBE eliminates these delays and reduces I/O activity
by making use of a high-performance "autopoll" channel pro-
gram. "Autopoll" solicits all terminals on the communica-
tions line to provide input and only terminates when an in-
put is received.

The installation procedure is simple and can be performed
by a system   programmer in a short period of time. Docu-
mentation is very good.

Competition

There are no competitive products at this time.

Market Definition and Penetration

QUICKTUBE works only under TCAM for which there are estimated
to be less than 400 to 500 total installations. With over
200 installed copies of QUICKTUBE, a large portion of the
market is already taken, and the remaining market is diminish-
ing as IBM successfully moves its users to VTAM.

This is a rental-only product at monthly rates of $650 for one
CPU and $1,000 for two-CPU systems.

Risk Analysis

The current market trend is for more users to move from
Bisync to SNA/SDLC, a networking protocol. SNA/SDLC re-
quires the use of an IBM 3705 with the NETWORK CONTROL PRO -
GRAM (NCP). The NCP eliminates the problem addressed by
QUICKTUBE and it can also control Bisync terminals using
a form of "autopoll" that is supported by TSO/TCAM.

In addition, QUICKTUBE is a modification to the IBM-supplied
code. Thus, a new level of the product must be released
when IBM updates the modified code.

H. HOTREADER

Technical Description

HOTREADER is an extension to IBM's OS/VS1 Operating System
designed to provide the "internal reader" facility supplied
within the SVS and MVS Operating Systems. The "internal
reader" is a mechanism that allows running jobs to submit
other jobs into the system, thus providing a form of Depen-
dent Job Scheduling. This mechanism also allows a fast job
submission scheme for products such as PANVALET and LIBRARIAN.
Without HOTREADER, the user would have to start a system
reader, through a documented interface, to submit the job's
JCL. The HOTREADER method requires less system overhead,
Installation is very simple and the documentation is ex-
cellent.

Competition

There are no comparable offerings at this time.

Customer Acceptance

The three users of HOTREADER that were contacted had little
to say. The installation procedure was easy and all felt it
was the kind of product that "you just install and forget
about problem-wise."

Market Definition and Penetration

This product has a limited market, estimated at less than
one thousand VS1 installations. However, IBM does offer
OS/VS1 for use on their 4300 series of processors.

Priced at $4,000 for a single CPU, SMM has sold only twelve
of these packages.

Risk Analysis

HOTREADER makes use of an internal system interface that is
not formally documented by IBM. This is a risk, since IBM
could change this interface at any time.

I. JOL

Technical Description

Job Organization Language (JOL) is designed to help a user
describe the operational processes surrounding a program or
system of programs, as is IBM's Job Control Language (JCL).
JOL is a command language that is easier to use than JCL
and that enables JCL commands to be imbedded in JOL commands
should the user choose to do so. In addition, JOL performs
scheduling, system maintenance, rerun/restart, networking and
spooling.

Market Definition and Penetration

JOL is applicable to all IBM OS systems, but its size and
price ($50,000-$80,000) dictate that its market consists of
relatively large sites - those with roughly 20,000 or more
jobs per day. JOL currently has its own division within SMM
with a dedicated product manager.

A DOS version is scheduled for release second quarter of 1983.

SMM forecasts modest unit sales for the next year, but these
few sales should yield sizeable revenue. Furthermore, JOL
has the capability to be a substantial product for the company
over the next few years.

Risk Analysis

JOL is a technically sound idea, but it has not received much
attention. Most users have made a major investment in training
their staffs in IBM's JCL and will be willing to spend additional
time and money only if they are convinced that savings - par-
ticularly from the elimination of JCL errors - will make JOL
a sound investment.

In addition, IBM tends to modify the JCL specifications as
each new release of the Operating System is created. JOL's
developer is not based in the U. S. and support for such
changes by IBM may prove to be a problem if they do not
respond in a timely manner.

SOFTWARE MODULE MARKETING
TABLE OF ORGANIZATION

APPENDIX A

HARRIS A. HERMAN

PRESIDENT

SUMMARY

Mr. Herman is the original founder of Software Module Marketing. His experience ranges from computer manufacturing and programming to marketing and sales. Primary emphasis has been on market and product evaluation of computer software programs.

EDUCATION

Attended the University of Massachusetts
Attended Phoenix College, Arizona
Selected by General Electric to attend its Business Training Course
Completed three-year graduate course offered as evening courses
  in conjunction with normal daily responsibility

PROFESSIONAL EXPERIENCE

Vice President/Sales, Automated Information Services. Marketing responsibilities for the sales and installation of the California Educational Information System (CEIS). National responsibility for product placement.

Marketing Manager, Boothe Computer Corporation, System Enhancement Division. Marketing responsibility for software products made available by Boothe Management Systems, as well as software acquired through marketing agreements. Territory responsibility included United States, Canada and South America. Additional responsibility in marketing the concept of facilities management.

District Manager, Recognition Equipment, Inc. Responsible for marketing OCR equipment in eight western states. Strong marketing thrust in state government. Responsible for all proposals and sales activity, field engineering, and direction of systems analysts.

Project Manager/Sales, Radio Corporation of America. Project Manager, RCA installation, Lockheed/Burbank, Responsible for implementation of on-line message switching/data collection system. For this installation, Mr. Herman was presented with RCA's Outstanding Achievement Award.

Project Manager, Department of Justice California Law Enforcement Telecommunication System (CLETS). Directed implementation (two in Los Angeles and two in Sacramento) of the nation's largest law enforcement message switching/inquiry response system to date. Responsibility for publication of functional specifications and overseeing subcontractor and RCA systems analysts' performance. Received RCA recognition by attending Quota Club in Mexico City. Phased into sales while Project Manager of CLETS to begin his sales career.

R E S U M E

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WILLIAM C. ZOLLNER

As Chief Financial Officer of Software Module Marketing,
William C. Zollner is responsible for preparation of financial
statements, financial forecasts, income tax returns, credit
management, cash flow planning, banking relationships and
interface with creditors and auditors.

Mr. Zollner was Controller of Corti Brothers, a chain of
specialty grocery and wine markets in Sacramento, California,
with annual gross revenues in excess of $30 million, from
July 1980 through December 1982. Mr. Zollner was responsible
for financial statements, forecasts, and income tax reporting,
as well as administration of the personnel and bargaining
agreements.

Prior to Corti Brothers, Mr. Zollner was the Chief Financial
Officer for Eagle Forest Products, the principal company among
four companies which manufactured and marketed wood mouldings
and other building products at a combined annual volume of
$40 million, for the period from June 1975 through June 1980.
From June 1973 to June 1975, Mr. Zollner worked for Ernst &
Whinney, a national accounting firm, primarily in its audit
department.

Mr. Zollner has been an active Certified Public Accountant for
the period from August 1975, providing management advisory service
and tax consulting for small business clients in the Sacramento
area.

Mr. Zollner is a member of the American Institute of Certified
Public Accountants, California Society of Certified Public
Accountants, and Benevolent Protective Order of the Elks, Lodge No. 6.

Harris A. Herman/President

Systems Representative for installation of the State of Calif-
ornis Department of Motor Vehicles System.

<u>Systems Programmer, General Electric Computer Division</u>. Respon-
sible for systems analysis and programming of internal accounting
systems for General Electric Computer Division, Phoenix, Arizona.

Responsible for analysis and programming of an on-line message
switching system for the Western Pacific Railraod, San Francisco,
California.

BUSINESS AFFILIATIONS

National Small Business Association/Washington, D. C.
ADAPSO, Software Industry Association

R E S U M E

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CAROLE D. MURPHY

SUMMARY

Over twenty (20) years of experience and responsibility in the areas of administration, finance, marketing and general management.

PROFESSIONAL EXPERIENCE

Executive Vice President/SOFTWARE MODULE MARKETING, INC.   Complete responsibility for the initial formation of the administrative, legal and financial operations of this international systems software marketing company. Direct responsibility for financial controls and strategies, contracts administration, personnel administration and manage-ment, reporting directly to the President. In 1978, Ms. Murphy assisted the President in the formation of SMM's foreign operations; in 1981, she was also instrumental in the formation of Image Design Studio, a division of SMM, with primary responsibility for the advertising and public relations of SMM.

Ms. Murphy joined SMM at its inception, and currently serves on the Board of Directors as Secretary/Treasurer.

Administrative Office Manager/INFORMATICS, INC.   Responsible for all administrative functions of the Sacramento Office of this international company specializing in system design, software and professional data processing services. Duties included financial controls, customer relations, personnel management, technical documentation, reporting directly to the President of Western Operations. Ms. Murphy was also the Assigned Project Administrative Assistant for the California Law Enforcement Telecommunications System (CLETS), to date the largest law enforcement system in the nation.

Executive Assistant/ROBERT F. BROWN & ASSOCIATES.   Responsible for all administrative functions of this consulting firm specializing in group insurance and pension and profit sharing plans for large industry and government agencies. Primary duty of assistant to the President in all phases of the general management of the business.

BUSINESS AFFILIATIONS

Ms. Murphy is a member of the following organizations:

    American Management Association
    National Small Business Association
    ADAPSO, Software Industry Association (Member of the Tax Committee)
    American Society of Professional and Executive Women
    Who's Who/American Business Women

R E S U M E

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Accountants, and Benevolent Protective Order of the Elks, Lodge No. 6.