

COMPANY OVERVIEW

Y-CDO

BACKGROUND

Sybase, Inc. was formed in November, 1984 to design, develop and market high performance relational database management software for on-line applications. Its corporate headquarters are located in a 30,000 square foot office in Berkeley, California, it has eleven sales offices throughout the U.S. and is opening one in Europe. The company employs 108 people.

PRODUCT

The Sybase product line consists of two product categories: The DataServer and the DataToolset. The Data Server provides all the data management functions and the DataToolset provides the user interface and application support function. Together they form the requester/server architecture and provide a relational DBMS whose features and performance exceed existing competitive products. The two products are designed to communicate through local area networks and operate on general purpose hardware.

DataToolset

The DataToolset provides a consistent and easy to use interface for non-sophisticated users. The interface is similar in style to the Apple McIntosh. The DataToolset works transparently on bit mapped terminals, character terminals or IBM PC's and compatibles. It has several design features which make it very simple to use:

1. Visual Query Language - This allows the user to interact with the database using a syntax free language. The user can construct queries by selecting items from a menu.
2. Report Writer - The report writer is very user friendly and allows a user to create and modify reports using a visual image of the report and does not require the use of a programming language.

The DataToolset is sold as a separate product. Every user accessing the database needs a DataToolset.

DataServer

The DataServer is a very high performance relational DBMS that performs all of the data management functions. The DataServer has several distinguishing features which enable it to be a high performance multi-user relational DBMS.

11/20/87
000-21

SYBASE, INC.

Due Diligence Report

September 1, 1987

Table of Contents

I Executive Summary

II Lease Analysis

III Capitalization

IV Industry Overview

V Company Overview

VI Management

VII Equipment

VIII Recommendation

APPENDIX I Business Plan

APPENDIX II Financials

APPENDIX III Resumes/References

APPENDIX IV Press

EXECUTIVE SUMMARY

THE TRANSACTION

Sybase, Inc. has approached Comdisco for a \$1 million lease line for one DEC VAX, two DEC Microvax 3's, three DEC Microvax 2's, three Sun 3's, miscellaneous peripherals and office furniture. The proposed lease line is for 36 months and has a 12% warrant coverage. The annual pre-tax yield ranges from a low of 11% (no residual value, no warrant value) to a high of 72% (60 P/E multiple, 25% residual value). The expected yield is 59% (40% P/E multiple, 17.5% residual). These yields assume Comdisco, as a warrant holder, exercises its warrants at the expected initial public offering in December, 1989.

THE COMPANY

Sybase is a late stage company that was formed in November, 1984 to design, develop and market high performance relational database management software and interfaces for on-line applications. The company's initial two products, the DataServer and the DataToolset, operate on the Sun Unix and the DEC VMS platforms. The products have been successfully beta tested and debugged.

The company has sold 125 units to end users through August, 1987. The company also has several OEM contracts which will leverage sales into segments of the market it cannot currently address individually. The company has a major OEM contract with Microsoft which will use Sybase's product as the database engine for its OS/2 products. Apple Computer just made a major investment in the company and Sybase is also expected to be the MacIntosh database engine. Sybase has received \$2.8 million for a product development contract with TRW to develop a high security database for the government.

THE PRODUCT

Sybase's product is the first of the next generation of database management systems (DBMS): high performance relational DBMS software capable of on-line transaction processing in a multi-user environment, while operating on general purpose hardware. The software is based on requester/server architecture which separates the user interface application functions from the database management functions. This architecture allows database management functions at a high speed while accommodating hundreds of users with virtually no more memory requirement than would be needed for one user.



THE MARKET

Sales of the relational DBMS software were \$200 million in 1986 and are projected to grow to \$1.2 billion by 1990. Sybase will initially target the on-line application segment of this market which is expected to grow from 10% to 50% of the total relational DBMS market by 1990.

MANAGEMENT

Sybase's technical team is superb and its marketing and sales teams are strong. Its CEO has no prior executive office experience but has thus far done an excellent job. The VP-Finance is inexperienced and the investors are prepared to upgrade the position if needed.

VENTURE CAPITAL

Sybase has raised over \$10.5 million in venture financing from four highly respected venture capital firms, TRW and Apple Computer. The investors are extremely bullish on Sybase and would not allow any new investors, except Apple, in the latest round. No future rounds are planned and the investors expect an initial public offering in late 1988 or early 1989.

FINANCIAL POSITION

Sybase is extremely well capitalized and has cash balances that will last eight months with no sales. The company's August 1987 end user sales were \$750,000, twice the level projected.

STRENGTHS AND WEAKNESSES

Sybase's product is the first of the next generation of DBMSs and has been successfully positioned away from the competition. Its sales have exceeded projections by a significant amount. Software is a very high margin product. The market for its product is growing rapidly. The company has a very strong financial position, high quality venture capital backing and a good management team. Sybase's primary weaknesses are that its CEO has no prior executive experience and its VP-Finance lacks prior financial experience. The company's primary risk is whether its competitors will develop a comparable product before Sybase obtains significant market share.

RECOMMENDATION

In my judgement, Sybase is an outstanding investment opportunity that has little downside risk and tremendous upside potential. I recommend that the Venture Lease Committee approve the transaction as proposed.

SUMMARY OF TERMS

Lessee: Sybase, Inc.
Berkeley, California

Lease Line: \$1,000,000

Draw Down Period: Twelve months

Lease Commencement: October 1, 1987 with monthly closings

Term: 36 months

Rate: Payments 1-18 2.9438%
Payments 19-36 3.5980%

Warrants: Number of common shares equal to 12% of
the Lease Line divided by \$1.00 per share.
$$\frac{\$1,000,000 \times 12\%}{\$1.00 \text{ per share}} = 120,000 \text{ shares}$$

Equipment Type: DEC Vax, Microvax II and Microvax III,
Sun 3, peripherals and office furniture

Estimated Residual: 17.5%

Key Man Life Insurance: None

Venture Capitalists: Kleiner Perkins, Hambrecht & Quist
Investment Partners, Oak Investment
Partners, Charles River Ventures, TRW
and Apple Computer

Board Members: Thomas O'Rourke
Hambrecht & Quist Investment Partners
Robert D. Williams
TRW
Paul Maeder
Charles River Ventures
Mark Hoffman
Sybase
Robert Epstein
Sybase

Board Attendance: Through the expiration of the lease term

EXHIBIT II

SYBASE, INC.

OFF RISK ANALYSIS

Month	Date	Equipment Cost	Assuming Fair Market Value			Assuming Liquidation Value			Assuming No Value			
			Cumulative Payments Received		At-Risk Value		At-Risk Value		At-Risk Value			
			\$	%	Residual	\$	%	Residual	\$	%		
0	09/01/87	\$1,000,000	\$0	0.00%	\$1,000,000	\$0	0.00%	\$1,000,000	\$0	0.00%	\$1,000,000	100.00%
1	10/01/87		\$29,438	2.94%	\$949,100	\$21,462	2.15%	\$940,750	\$29,812	2.98%	\$970,562	97.06%
6	03/01/88		\$176,628	17.66%	\$694,550	\$128,822	12.88%	\$644,600	\$178,772	17.88%	\$823,372	82.34%
12	09/01/88		\$353,256	35.33%	\$389,100	\$257,644	25.76%	\$289,100	\$357,644	35.76%	\$646,744	64.67%
18	03/01/89		\$529,884	52.99%	\$340,450	\$129,666	12.97%	\$240,450	\$229,666	22.97%	\$470,116	47.01%
24	09/01/89		\$745,764	74.58%	\$291,800	(\$37,564)	-3.76%	\$191,800	\$62,436	6.24%	\$254,236	25.42%
30	03/01/89		\$961,644	96.16%	\$233,700	(\$195,344)	-19.53%	\$133,700	(\$95,344)	-9.53%	\$38,356	3.84%
36	09/01/90		\$1,177,524	117.75%	\$175,600	(\$353,124)	-35.31%	\$75,600	(\$253,124)	-25.31%	(\$177,524)	-17.75%

Month in which Condisco is off-risk assuming alternative equipment values

Fair Market Value	23
Liquidation Value	27
No Value	32

EXHIBIT I
SYBASE, INC.
YIELD ANALYSIS

IRR AT ALTERNATIVE P/E MULTIPLES AND RESIDUALS

		----- Alternative P/E Multiples -----			
		Worst -----	Low -----	Medium -----	High -----
P/E Multiple		0	25	40	60
Price per Share		\$0.00	\$7.75	\$12.41	\$18.61
Residual -----					
0.00%	Pre-Tax	11.00%	42.87%	56.33%	69.73%
	After-Tax	8.26%	35.08%	47.28%	59.75%
17.5%	Pre-Tax	18.89%	46.12%	58.55%	71.24%
	After-Tax	14.75%	38.17%	49.47%	61.29%
25.00%	Pre-Tax	21.66%	47.40%	59.44%	71.86%
	After-Tax	17.11%	39.40%	50.36%	61.92%

Lease Assumptions:

Lease Line Amount	\$1,000,000
Lease Rate Factor	3.2460%
Term of Lease (months)	36
Payment Frequency	Monthly
Payment Timing	Advance
Warrant Coverage	12.00%
Warrant Strike Price	\$1.00
Number of Warrants	120,000
Estimated IPO	1989
Year Warrants Exercised	1989
Exercise Year Revenues	\$41,500,000
Exercise Year Earnings	\$7,195,000

Current Capitalization:

Common	5,924,474
Preferred Series A & B	8,947,365
Current Preferred Series C	5,815,000
Warrants	392,308
Comdisco Warrants	120,000
Pre-IPO Shares	21,199,147
IPO Shares	2,000,000
Post IPO Shares	23,199,147
	=====

Comparable P/E Multiples on August 31, 1987:

Oracle	50
Informix	46
Microsoft	45

COMPUTER STOCKS

Group Stock Performance

STOCK GROUP	Thurs. Close	Chg. For Week	% Chg. For Week	% Chg. From Dec. 31, '86
CSN Index (52 Stocks)	2130.48	+ 22.89	+ 1.1%	+ 66.0%
Large Systems	801.77	-13.51	-1.7%	+ 56.4%
Desktop Systems	260.02	+ 0.26	+ 0.1%	+ 99.8%
Software (Large Systems)	141.51	+ 3.76	+ 2.7%	+ 40.2%
Software (Small Systems)	257.25	+ 8.00	+ 3.2%	+ 97.6%
Local-Area Networks	86.01	+ 2.37	+ 2.8%	+ 27.9%
Peripherals	218.90	-2.37	-1.1%	+ 39.4%
Semiconductors	365.02	+ 24.39	+ 7.2%	+ 96.9%

• WRAP-UP •

MIXED WEEK FOR HIGH-TECH STOCKS: Technology stocks reflected the recent uncertainty of the overall stock market in the week ended Aug. 27, but still showed an increase for the period.

CSN's overall index rose 22.89 points, to 2130.48. Twenty-five stocks advanced, 24 declined and 3 were unchanged. IBM, down \$8.50 for the week, garnered much of Wall Street's attention.

The index has been amended to include Cullinet Software Inc., a stock that was not previously part of the CSN 52. Cullinet replaces Uccel Corp., which recently merged with CA. The difference between this week's closing index price and last week's reflects differences between the stock prices of Cullinet and Uccel.

• COMPONENT STOCKS: By Group •

Software (Large Systems)

Company	Thursday Close	Change Week	% Change Since 12/31/86	Sales: Last 4 Qtrs. (\$ MIL.)	EPS	Cap./Sales	P/E
CA	31.5	+ 2.50	+ 129%	348.4	0.77	4.5	41
Cullinet	13.13	+ 0.25	+ 91%	190.7	-0.78	2.2	N/A
Duquesne	17	-1.25	+ 7%	34.8	0.71	5.3	24
MSA	12.88	+ 0.38	+ 1%	223.0	0.37	1.0	35
Morino (s)	19	+ 0.75	+ 44%	31.2	0.58	8.0	31
Parasoft	22	+ 2.00	+ 70%	114.8	0.95	3.4	23
VM	19	-1.25	-10%	29.5	0.88	4.0	27

Software (Small Systems)

Company	Thursday Close	Change Week	% Change Since 12/31/86	Sales: Last 4 Qtrs. (\$ MIL.)	EPS	Cap./Sales	P/E
Aahon	23.50	-1.00	+ 6%	244.4	1.51	2.4	19
Autodesk	28.50	-0.50	+ 122%	65.2	0.71	10.0	40
Informix	21.75	+ 0.50	+ 123%	29.5	0.47	6.5	46
Lotus	33.00	-0.75	+ 91%	326.2	1.23	4.9	27
Microsoft	115.75	+ 10.50	+ 140%	345.9	2.59	9.3	45
Oracle	24.75	-0.50	+ 92%	131.9	0.50	6.1	50
Soft Pub	10.00	-0.25	+ 43%	34.3	0.55	2.2	19

Local-Area Networks

Company	Thursday Close	Change Week	% Change Since 12/31/86	Sales: Last 4 Qtrs. (\$ MIL.)	EPS	Cap./Sales	P/E
Bridge	23.50	+ 1.00	+ 50%	59.2	0.75	3.4	31
Net Sys	11.38	-0.25	-18%	109.9	0.59	3.0	19
Novell	23.75	+ 1.25	+ 84%	136.4	0.62	4.7	38
3Com	17.50	+ 0.87	+ 9%	110.3	0.76	2.5	23
Ungermann	8.88	-0.50	+ 7%	128.4	0.32	1.4	31

Desktop Systems

Company	Thursday Close	Change Week	% Change Since 12/31/86	Sales: Last 4 Qtrs. (\$ MIL.)	EPS	Cap./Sales	P/E
Apple	21.13	-0.82	+ 31%	478.9	0.81	1.9	35
Apple (s)	52.00	+ 0.25	+ 157%	2385.4	1.35	2.9	39
Alpha	13.38	0.00	+ 19%	153.9	0.73	1.2	18
Compaq	8.13	+ 0.38	+ 38%	220.4	0.88	1.2	N/A
Converg	57.00	+ 0.50	+ 19%	812.8	2.13	2.4	27
Silicon	39.25	+ 0.25	+ 56%	86.3	0.80	3.2	25
Sun	25.13	-0.75	+ 51%	534.4	1.13	2.0	32

Large Systems

Company	Thursday Close	Change Week	% Change Since 12/31/86	Sales: Last 4 Qtrs. (\$ MIL.)	EPS	Cap./Sales	P/E
Alliant	18.25	+ 1.00	-9%	46.3	0.76	4.2	23
Amnshl	41.83	-0.75	+ 78%	1218.3	1.88	1.9	22
Comdex	14.50	-0.75	+ 51%	54.7	0.29	6.9	37
DEC	188.75	+ 4.00	+ 80%	9389.4	8.53	2.7	22
DG	33.50	-0.88	+ 13%	1272.3	-0.83	0.7	N/A
HP	65.75	-0.50	+ 57%	7744.0	2.37	2.2	29
IBM	168.25	-8.00	-39%	5228.0	7.29	1.9	23
Prime	28.50	+ 0.25	+ 74%	810.4	1.10	1.5	26
Status	29.50	-1.25	+ 40%	147.8	0.75	4.0	29
Tandem (s)	31.88	-0.13	+ 86%	964.9	1.01	3.3	32
Unisys	44.50	-2.13	+ 67%	9648.8	-0.03	0.7	N/A
Wang	17.88	-0.12	+ 54%	2838.7	-0.44	1.0	N/A

Semiconductors

Company	Thursday Close	Change Week	% Change Since 12/31/86	Sales: Last 4 Qtrs. (\$ MIL.)	EPS	Cap./Sales	P/E
Intel	55.50	+ 4.50	+ 164%	1513.1	-0.52	4.5	N/A
Motorola	88.88	+ 4.00	+ 93%	6236.0	1.79	1.4	38
National	15.25	+ 0.50	+ 44%	1867.9	-0.38	0.8	N/A
TI (s)	75.13	+ 5.13	+ 91%	5228.9	2.21	1.1	34

Peripherals

Company	Thursday Close	Change Week	% Change Since 12/31/86	Sales: Last 4 Qtrs. (\$ MIL.)	EPS	Cap./Sales	P/E
Adeptec	14.00	+ 1.00	+ 26%	80.3	0.84	1.8	17
CDC	33.00	-1.83	+ 25%	3328.7	-0.73	0.4	N/A
Datapoint	11.50	0.00	0%	331.8	0.33	0.7	35
Emulex	7.83	0.00	-8%	104.4	0.42	1.0	18
Heaton	13.83	-1.00	-22%	188.9	0.98	1.3	14
Microport	34.00	-0.75	+ 91%	239.9	2.05	1.8	17
Miniforbe	14.13	-0.12	+ 81%	242.7	0.70	2.0	20
Seagate	30.25	+ 1.00	+ 58%	956.0	2.81	1.6	11
W. Digital	35.13	+ 0.50	+ 52%	482.4	2.00	1.8	14
Key	32.83	-1.37	+ 89%	287.4	1.53	1.5	21

EXPLANATION: All the stock groups—including the CSN Index of 52 stocks—are simple arithmetic summations of the stocks appearing in the "Component Stocks" section.

Notes: Last 4 Qtrs. Sales is the last four quarters of a company's sales. EPS is based on a simple method of dividing the net earnings per share. "Cap. Sales" divides the total stock market value of a corporation by its sales—a measure considered valuable by many high technology investors. "P/E" (price-earnings) ratio divides the market price of the stock by the per share earnings. The company's sales are given in its most recent four quarters. The EPS figures are derived from net income and they include some non-recurring items such as gains on sales of assets or tax loss carryforwards. Also, where applicable, the EPS figures assume full dilution of convertible preferred securities.

Stock sales multiplied by an "s" is then taken into account by the use of multipliers. For instance, a stock that is split 2:1 will receive a multiplier of 2 when summed in one of the groups. All stocks began June 11, 1987 with a multiplier of 1.

CAPITALIZATION

Amount of Capitalization

Sybase has raised \$10.6 million from seven high quality venture capital firms including TRW and the Strategic Investment Group of Apple Computer. Please refer to Exhibit I of this section for a detailed Schedule of Capitalization.

The firms interviewed expressed tremendous excitement about their investment in Sybase and expect the company to go public in late 1988 or early 1989. The actual IPO timing will be a function of market conditions and company performance.

The company completed a \$3.3 million round of financing in August, 1987. All of the money came from the existing venture capital firms. The primary investors reluctantly cut back the size of their recent commitment in order to appease Apple, who wanted a more substantial investment in Sybase. No further private equity financings are anticipated.

Description of Venture Capital Firms

The following is a brief description of the venture capital firms and their involvement with Sybase. Several of the firms were interviewed. Please refer to the Interview Notes in the back of this section for more information.

Kleiner, Perkins, Caufield and Byers, San Francisco, CA

Founded: 1972

Capital under management: \$388 million

Kleiner Perkins owns 12.75% of Sybase and is a co-lead investor in this transaction. Kleiner Perkins gave up its Board seat to David Liddle of Metaphor. Metaphor is not an investor in the company but has helped fund Sybase product development port to the Sun Unix based systems.

Hambrecht & Quist Venture Partners, San Francisco, CA

Founded: 1968

Capital Under management: \$660 million

Hambrecht & Quist owns 14.1% of Sybase and is a co-lead investor in the company. Thomas O'Rourke, General Partner, is on the Board. Hambrecht & Quist's venture lease arm has also provided \$2.5 million of equipment lease financing to Sybase and has recently entered into an accounts receivable financing package for the company.

Charles River Ventures

Founded: 1970

Capital under management: \$150 million

Charles River owns 14.8% of Sybase and is the largest single investor in the company. Paul Malder, General Partner, is on the Board.

TRW

TRW is not a venture capital firm and it owns 13.4% of Sybase. Robert Williams of TRW is on the Board. In addition to its equity investment in Sybase, TRW has provided Sybase \$2.8 million for development of a high security database to be sold to the defense and intelligence sectors of the government. TRW product development funding has helped reduce the amount of venture capital Sybase needed to develop its product.

Apple Computer

Apple Computer's Strategic Investment Group owns 6.2% of Sybase and made its investment in August, 1987. The size of this round was increased in order to accommodate Apple, who wanted a more significant investment in Sybase. Although no agreement has been signed, Apple is expected to contract with Sybase to develop a database manager for the MacIntosh. Apple has paid Sybase \$40,000 to have it begin looking for people to work on the contract.

Oak Investment Partners

Founded: 1978

Capital under management: \$235 million

Oak owns 7% of Sybase and does not have a Board seat. Bandel Carano, Associate, oversees Oaks investment in Sybase.

Conclusion

Sybase is very well capitalized and backed by several excellent venture capital firms and Apple Computer and TRW. All of the backers are very excited about their investment and feel Sybase has tremendous potential. During the financing round which closed in August 1987, the existing investors argued among one another because each wanted a larger share of Sybase. The investors have not accepted any new investors except Apple Computer. The Apple investment is significant because it generates very positive publicity for the firm and will likely lead to Sybase developing a database manager for the MacIntosh.

SYBASE, INC.
SCHEDULE OF CAPITALIZATION

Preferred (3)	Series A		Series B		Series C (1)		Series C (2)		Total		
	Shares	Amount	Shares	Amount	Shares	Amount	Shares	Amount	Shares	Amount	%
Kleiner Perkins	1,315,789	\$500,000	769,231	\$500,000	291,290	\$291,290	310,971	\$310,971	2,687,281	\$1,602,261	12.75%
Hambrecht & Quist	1,089,473	\$414,000	1,038,460	\$675,000	310,022	\$310,022	523,223	\$523,223	2,961,178	\$1,922,245	14.05%
TRW	1,315,789	\$500,000	769,231	\$500,000	291,290	\$291,290	441,738	\$441,738	2,818,048	\$1,733,028	13.37%
D' Rouke	131,579	\$50,000	110,384	\$71,750	20,000	\$20,000	0	\$0	261,963	\$141,750	1.24%
Anglo-Cont	94,737	\$36,000	0	\$0	0	\$0	0	\$0	94,737	\$36,000	0.45%
Oak Investments	0	\$0	0	\$0	1,250,000	\$1,250,000	232,366	\$232,366	1,482,366	\$1,482,366	7.03%
Charles River Ventures	0	\$0	2,307,692	\$1,500,000	322,398	\$322,398	488,914	\$488,914	3,119,004	\$2,311,312	14.80%
Apple Computer	0	\$0	0	\$0	5,000	\$5,000	1,300,000	\$1,300,000	1,305,000	\$1,305,000	6.19%
Other	0	\$0	5,000	\$3,250	25,000	\$25,000	2,788	\$2,788	32,788	\$31,038	0.16%
Total Preferred	3,947,367	\$1,500,000	4,999,998	\$3,250,000	2,515,000	\$2,515,000	3,300,000	\$3,300,000	14,762,365	\$10,565,000	70.03%
Common											
Founders Stock	3,940,000	\$0							3,940,000	\$0	18.69%
Other	1,564,697	\$131,000							1,564,697	\$131,000	7.42%
Shareholder Receivables	0	(\$78,000)							0	(\$78,000)	0.00%
Options Reserved	419,777	\$0							419,777	\$0	1.99%
Warrants	392,308	\$0							392,308	\$0	1.86%
Total Common	6,316,782	\$53,000							6,316,782	\$53,000	29.97%
Total Equity	16,580,931	\$1,606,000	4,999,998	\$3,250,000	2,515,000	\$2,515,000	3,300,000	\$3,300,000	21,079,147	\$10,671,000	100.00%

(1) Initial Series C round closed in December 1986

(2) Secondary Series C round closed in August 1987

(3) Each share of preferred stock is convertible into one share of common stock, subject to adjustments for future dilution, and is automatically converted in the event of a public offering at a share price of not less than \$4.00 and an aggregate offering price of greater than \$5,000,000. Preferred shareholders are entitled to voting rights equal to the number of shares into which each preferred share is convertible.

SYBASE, INC
Venture Capital Interview

Date of Interview: July 24, 1987

Interview with: John Johnston, General Partner
Hambrecht & Quist Ventures

Participating: Bill Tenneson

Venture capitalist overview:

Tom O'Roarke, ex-chairman of Timeshare and is Senior General Partner at Hambrecht & Quist, is the Board member representing H & Q at Sybase. John, however, is the day-to-day contact at H & Q and did the original due diligence on the company.

Regarding IPOs and various multiples, the chief competitors for Sybase are: Oracle Systems, which is currently trading at five to six times sales of \$130 million or market value of \$700 million; Informix, which just had revenues of \$20+ million and is valued at \$120 million; Relational Technology, Inc. had a \$20 million year last year without any profitability and was offered \$100 million for the company. Sybase could go public as soon as early 1989 if they stay on plan. At that point, they would have to have sales in the \$18-\$20 million range and be profitable.

Why has Sybase chosen the Sun and Vax markets as their primary target markets?

Because these are the two main markets with a huge growth potential. These are also the primary scientific and engineering markets.

Who are Sybase's competitors?

The competitors include Oracle; Relation Technology, Inc., in Emeryville, which will have a \$50+ million year; Informix, a public company; Unify, a private company in Sacramento. IBM is also pushing its new relational database product called Database II.

Do the Sybase products require a dedicated additional piece of hardware to operate? If not, what effect does the addition of the Sybase software have on the rest of the network?

No it doesn't. It should unburden the rest of the network. The reason is that Sybase has separated the front-end of the

database processing from the back-end so that a user can format screens, input information, etc. and not tie up an entire channel or pipe in the whole database system. Also, the back-end or processing area of the program can process database work orders separately from the front-end user operation. The system does not require separate hardware.

The technological development stage for the company seems to have been completed. The question seems to be how effective the sales and marketing team is. What is your opinion of the sales and marketing organization?

In marketing, they are doing a great job. Stu Schuster has come in and has had a great effect on the marketing process. He has done a very good job of segmenting the market for sales of RDBS, not only for external sources but for the internal investors. John feels that Stu's segmentation of the market in and of itself has increased the stock price by 50% in an earlier round of financing. IBM and Tandem address the high-end user market, which has a high number of users with a high number of transactions. Stu Schuster is an ex-Tandem person and understands the market quite well. In the sales area, Peter Mork is the Vice President of Sales, John Johnston did the executive search himself. Mork is an ex-Data General person. He is a good motivator, good at customer selection and good at hiring people. His projections for sales seem to be accurate. But the real task of sales lies ahead.

What do you think of the management team in general?

John describes Bob Epstein as a god. He, understands the customers, the technology and the market and he is one of the few people that Hambrech & Quist would finance for any venture he undertook. Mark Hoffman is described as steady, consistent, a good operating person but not very charismatic, not the kind of guy that would gain an extra \$2 or \$3 a share on a roadshow for an IPO. Dave Turner, Vice President of Finance, is the weakest of the management team. John says he doesn't have a grasp of the big picture. Also, he does not take the burden of total financial management off Mark Hoffman's shoulders. He is, however, a bright and energetic guy and a good learner, so he will stay in his current position and the Board of Directors will watch his growth.

There seems to be a high sales priority on developing the OEM relationships, can you give me a progress report to date?

The chief priority in sales is actually in the end user market since the gross margin is much higher than in the OEM area. Regarding OEMs, there are rumors of an agreement with Microsoft. However, whatever the agreement is, it is not

currently in negotiation and whatever is done is done. There is an OEM relationship developing with Metaphor, which is a start-up company; also with Pyramid, not a very exciting company; with TRW and with Stratus.

The market is exploding, it is not a mature market now, and there is not enough discipline within the sales force to concentrate specifically on any OEMs. The sales people are out talking to whomever is interested in the market now.

How would you compare Sybase's chances for success vs. the rest of your portfolio companies?

Clearly better than average.

What is to keep some of the large well-capitalized software companies from entering the market?

Oracle is worried about Sybase staking out the high ground of the RDBS market. In fact, John feels that Sybase is becoming the standard in that market. John says that there is a long development cycle, at least three years in a small company; in a bigger company it would probably take a lot longer. Oracle and Informix have announced, or are about to announce, products with separated front-end and back-end products like the Data Server and Tool Set. But both Oracle and Informix are going to have the sales problem of what to tell the customers who have already bought their products, about why they should buy their new products.

How has the company performed vs. planned to date?

Pretty well. However, the real revenues are just coming in. The VMS product slipped a little for a few months, while the Sun product was getting its designs finished. John's general feeling about the overall performance of the company is better than expected. John said that the key they now need is to get customer feedback from those who are using the product. There is a need to de-bug and expand the product in the field. The company also needs to have a distributive database product, which is in the process of development. A distributive database is one where different machines have different portions of a total database. End users want to draw on all of those different portions of the database to process their inputs. The key sales pitch is going to be Sybase's ability to process transactions as measured by transactions per second and number of users able to use the system.

SYBASE, INC
Venture Capital Interview

Date of Interview: August, 26, 1987

Interview with: Paul Maeder, General Partner
Charles River Ventures

Participating: Rick Stubblefield

What is your opinion of Bob Epstein?

Bob is extremely bright. He is an industry know-it-all. He has the respect of everyone in the relational database industry. He is the single biggest reason for investing in this company. As you probably know, Bob was the chief architect working on the Ingres project at Berkeley and designed the relational database at Britton Lee. He has built three systems from the ground up in the past. Bob is an industry illuminary.

What is your opinion of Mark Hoffman and is he qualified as a Chief Executive Officer?

He has never had executive officer experience in the past. While at Britton Lee he was Vice President of Operations. As head of operations, he was not involved in marketing, sales or finance, so he has not demonstrated an ability to manage those functions. However, he is a good operations person, has excellent people skills, and has a strong relationship with the Board. I feel Mark brings to Sybase what is wanted in a Chief Executive Officer of a high-tech company. He's a good planner, keeps focussed and puts one foot ahead of the other. Mark is not flamboyant and he's shy. I expect it will be difficult for him to get up in front of some major investment bankers when the IPO comes. Sybase has a very technical product, and as such, its a technical sell; both from a financing point of view and a marketing point of view. Bob Epstein has a keen ability to translate highly technical concepts into layman's terms. I feel that between the two of them, Bob Epstein and Mark Hoffman, they make an excellent management team.

Does Sybase have a chairman?

No, we don't have any appointed chairman. No one at the company has a big enough ego to care. As far as meetings go, however, Mark is the de facto chairman.

How competent of a marketer is Stu Schuster?

Stu knows the market well. He has had many years of experience working at Relational Technology where he was very

successful. He is not a frustrated sales guy so he does not step on the salesmen's toes. Stu has done an excellent job on product positioning. Sybase's initial marketing strategy has been to differentiate its product from Oracle and Ingres. Stu is credited with coming up with the on-line transaction processing positioning of the product and he also adopted the mission critical system approach. He has done a very effective job of getting the message across. Sybase has gotten tremendous publicity primarily as a result of our product positioning. The market clearly understands that Sybase offers an on-line relational database. No other database software company can make that claim.

At the time Sybase was hiring it's marketing executive the choice came down to Stu Schuster and one other guy. The other individual was more flamboyant and flashy and had experience in non-related industries. In retrospect, I don't think we could have made a better choice.

What is your opinion of Peter Mork, Vice President of Sales?

Peter is a very forthright individual. Peter doesn't lie about projections. When he states a sale is 70% probable, he is generally accurate. If he feels sales projections are too aggressive, he will state that to the Board. His sales predictions are always accurate. Peter is hitting his numbers and meeting his quotas. He has built a very effective sales organization without any significant mistakes. And he's done that very quickly. Most importantly, he has hired good people.

Is David Turner an experienced financial officer?

That remains to be seen. David is very short on experience, and I doubt he's the type who is going to take this company public. He actually comes across as more of a low-key controller type. However, his reports are thorough and accurate and always done in a timely basis. I have start-up companies with shakier CFO's. The Board is keeping close watch on David.

What about the remaining members of the management team?

The balance of the management team is largely middle management and I don't know them very well. However, senior management seems to think highly of them. Most of them have significant experience in the relational database field and have prior employment histories at Britton Lee. All in all, I think the company has a very solid management team. The only possible hole is David Turner as Chief Financial Officer.

When do you expect Sybase to go public?

I haven't given that a whole lot of thought. My emphasis is on building a solid company and insuring the company has sufficient capital to meet its objectives. The company is projecting \$8 million of sales in 1987 and \$18 million next year. Assuming it meets those projections and is profitable by 1988, I expect an IPO anytime after late 1988. The most likely scenario is an IPO in early 1989.

What is a reasonable PE multiple at that period of time?

Of course that would depend on market conditions at the time. But Oracle, a mature company, has a PE multiple of 30. Coming out of the blocks, I would expect a PE of 40 or more.

During the month of July, the company seemed to burn far more cash than projected. What was this attributed to?

The company pays its employees every other week. During the month of July, it had three payrolls. From an income statement point of view, however, payroll was an accrued liability, so net income was right on plan. The company will catch up in August.

Do you expect a future product development contract from Apple Computer?

Apple has not made a commitment to date. However, I think its investment in the company is significant and there has been some discussion on Sybase porting its database manager to Apple's computers.

What is the nature of the Microsoft/Sybase agreement?

Nothing has been officially announced. However, Sybase is porting its dataserver to the OS2 environment. The OS2 will be the predominant environment beginning next year. Microsoft plans on having the Sybase dataserver be its database management engine. Microsoft will begin selling the product next year. The reason for the delay, is that Microsoft wants to design its own front-end. It expects to announce the product in the latter half of 1988.

What is the nature of the TRW/Sybase contract?

As you know, TRW is a major equity investor in the company. It has also provided Sybase with \$2.8 million in product development revenue. Sybase is developing a secured data product for TRW. This product is being targeted for the high security areas of the government such as the CIA, the NSA and the NSC. There is no agreement as to how future revenues will be split. It will most likely be a royalty

arrangement. Furthermore, Sybase will more likely than not have the right to sell the product outside of the government.

How is Sybase product being positioned?

Sybase product's position is an on-line mid-range relational database management system (RDBMS).

How large is the on-line RDBMS market?

The on-line market is huge. The Tandem non-stop computer is sold solely to this sector of the market. Stratus also sells only a high-tolerance product. The true size of the market is unknown in the mid-range computer area. To date, Britton Lee has been the only on-line solution. Britton Lee has tremendous problems because of its specialized hardware. Sybase is the first software company to develop a true on-line RDBMS. The only products on the market are currently decision support type products. As a result, there are no true numbers that define market size. But based on what we've heard, the potential market size is huge.

Is the move out of hierarchical databases and into relational databases permanent?

Hierarchical databases are very inflexible. Nonetheless they are very quick. Relational databases are far more user friendly and more flexible. Each time a change is made to the structure of the database, it does not require a major rewrite of the program. Relational will accept most any type of query. The problem with relational, it that it is very slow. The market is committed to the move to relational databases, but what the market needs is a high-performance RDBMS which meets the performance characteristics of a hierarchical. In my opinion, Sybase has addressed this market need. As a result, we will continue to see a permanent movement out of hierarchical and into relational.

How significant of competitors are Oracle and Relational Technology, Inc.?

Oracle and Relational Technology dominate the decision support segment of the RDBMS market. Both companies offer low performance RDBMSes. In addition, neither can be used effectively in a multi-user environment. As a result, most of their sales have been to small departments where two to three users access the database. Sybase is really not a competitor of theirs. Sybase's system architecture provides for effective multi-user use and it provides on-line transaction processing. The performance characteristics of the Oracle and RTI products are vastly different than the Sybase product.

Do you expect Oracle and RTI to develop new products which are similar to Sybase?

I feel they need to to compete. However, they have a major problem. To do so would be to cannibalize their existing installed base. In addition, they need to continue to service and support the existing product base. Their biggest dilemma is the same one IBM faces every time it introduces a new machine. Both companies must keep marketing and selling the old product to maintain revenues and company profitability. However, any new product development would obsolete the old product, thereby upsetting customers. There is also some question as to whether they have the people qualified to build the system architecture similar to Sybase. The answer to that is probably yes. However, in order to do so, they must scrap their old architecture and must start over from ground zero. The new architecture must be geared toward speed. I figure that it will take them at least two to three years before they do that.

Oracle recently made a new product announcement. What is the significance of that?

Oracle has a history of using product announcements as strategic weapons. It feels that by announcing products early it will cause customers to defer purchase decisions and wait for Oracle's product. Oracle has never met product announcement schedules. When I hear of an Oracle announcement, I don't get concerned.

Is Britton Lee a competitor of Sybase?

Britton Lee is probably its purest competitor because it offers high performance database solutions. However, it has the wrong approach. In order to improve performance of its relational database, Britton Lee built a special purpose computer. Using specialized hardware is a major mistake on Britton Lee's part. Managers of computer departments would much rather purchase a brand name computer that can be used in a multitude of environments should it eventually scrap the database. Not buying a DEC, IBM, Sun computer could be a career limiting move for these managers.

Is Teradata a competitor of Sybase?

Teradata emphasizes ultra-high performance. They are a more expensive solution and effectively address a different market.

SYBASE, INC
Venture Capital Interview

Date of Interview: August 28, 1987

Interview with: Bandel Carano, Associate
Oak Investment Partners

Participating: Rick Stubblefield

How do you feel about your investment in Sybase?

Sybase is the best positioned relational database system company in the market. It is the only company that has the potential to displace Oracle as the market leader. We are so bullish on Sybase that we would have liked to invest the entire \$3.3 million in the recent round of financing. Each of the investors wanted to invest as much money as they could. It got to be a pretty fierce battle over which investors got what percent of the company. At one point, we thought about excluding Apple Computer from this round of investment. However, the investors finally came around and recognized the significance of Apple being on board and decided to let them in. This company has significant upside potential. However, it still has the same old risks any other start-up company has. It has to market and sell their product.

How solid as a Chief Executive Officer is Mark Hoffman?

Initially the Board was not sure how long Mark would last as President and CEO of Sybase. His past experience is primarily in operations, and he has never handled finance, marketing or sales. To date, he has demonstrated a keen ability to grow into the job. He is a solid executor and implements strategy effectively. At this stage of the company's development, it needs more of an operations type executive to insure the product is built adequately and the company is staffed appropriately. Mark is not a great strategy person, Epstein is however. Because of that, Mark has a less illustrious role in the organization. At some point, we may have to beef up the executive branch of this company by hiring a real solid chief executive officer under Mark Hoffman.

What is your opinion of Bob Epstein?

Well, Bob is the reason Sybase exists today and is the reason the investors chose to back Sybase. Epstein is an industry luminary. He identified a need in the relational database market. Relational databases lag significantly in performance relative to hierarchical and operate at one

fifth to one tenth of the speed. Historically, they have been unable to handle heavy industrial applications. Relational databases were primarily used for workstations in small departments with few users. Bob came up with the concept of developing a high performance relational database management system that ran on general purpose computers, had high data integrity and could be used in industrial applications. Bob has tremendous experience in the relational database system market. He was the original architect of Ingres and BLI products. Bob is the key to this organization.

How solid of a Vice President of Marketing is Stu Schuster?

In my opinion, Stu Schuster is one of the best. He has extensive prior experience at Relational Technology, where he was V.P. of Marketing and responsible for business strategy. He has done a very effective job marketing our product and communicating its benefits. Our publicity to date has been outstanding. He's been very effective at developing market awareness and getting Sybase's message across. The key initial strategy in marketing our product has been to not position our product as similar to Oracle. I feel we have done an outstanding job of that.

What is your opinion of Peter Mork, Vice President of Sales?

Peter had a very successful track record while at Data General. However, prior to coming to Sybase, he spent a year at Counterpoint. He was not very successful in that position and I feel that was primarily because Counterpoint was having some serious difficulties selling its product. To date Peter Mork has done quite an exceptional job. He has high integrity and has had no difficulty meeting his numbers. The Board is pleased with Peter.

Is David Turner qualified to be Vice President of Finance?

No he's not. In fact, it was a mistake for the company to make David V.P., Finance. David is more of a controller type. However, the Board has been patient with David and is watching his growth carefully. We recognize that between Mark and Dave we have a weak link in finance and are fully willing to bring in a high-powered CFO if needed. We expect that may take place sometime next year. Once we reach significant growth levels, and it appears imminent that we will have an IPO, I feel it is important that we get a high-caliber CFO in.

What has Sybase done that enables it to achieve the high performance in a multi-user environment that none of its competitors have been able to achieve?

Sybase uses a system architecture called "requester/ server architecture". This design splits the front-end application aspect from the back-end data management aspect of the program. Once they accomplished this, it enabled them to use a multi-threaded approach which enables them to serve multiple users without a corresponding increase in computer memory. In addition, they have compiled specialized SQL commands which enable the querying and updating of the database to be done far quicker.

What is preventing the competition from adopting a similar system architecture?

The competition has committed themselves to the old system architecture. In order to develop this new architecture they would have to scrap the old line entirely and start from ground zero and rebuild the product. In order to do this, they would have to cannibalize their existing line of products. It is unlikely that they would adopt such an approach. In the meantime, they have to continue selling their existing database in order to generate revenue. At some point in time when they switch over, they are going to upset the current customer base. Sybase is in the right place in the right time. It is unlikely that Oracle or Relational Technology will make modifications in the short-term to their program which will enable them to compete effectively with Sybase.

What is the significance of the product development contracts the company has negotiated with TRW, Microsoft, Metaphor and Stratus?

These contracts are significant. Sybase has raised money from these companies so that Sybase can port its product to these companies' operating systems. This generally costs substantial amounts of money and Sybase has been able to get the other companies to pay for this. The significance of this, is that the other companies feel that Sybase is a hot product, otherwise they wouldn't spend the money to have it operate on their system.

The TRW contract is directed towards the military market where Sybase will develop a high security uncrackable database. Apple and Microsoft, although both still unannounced, will have Sybase on the desk tops of every company in America. Stratus is in the high tolerance business and will give Sybase an entree into the on-line market. And, in the meantime, Sybase will go out and sell its product to end users.

When do you expect Sybase to have an IPO?

None of the investors want to rush Sybase to market. Each feel they have a significant opportunity with Sybase. As a result, we are going to probably wait until 1989 to go public. We want to demonstrate we have a solid core business that's generating profits and substantial sales.

What do you expect the PE multiple to be at that time?

Of course that depends on market conditions and company performance at that time. But, Oracle went out at over 50 and it is still trading at a multiple of 30 to 40. If we establish ourselves, I feel we will be perceived as having significantly more upside than Oracle. I can't predict a multiple, but to be conservative, 40.

SYBASE, INC.

FINANCIAL STATEMENTS

YEARS ENDED DECEMBER 31, 1986 AND 1985

WITH

REPORT OF CERTIFIED PUBLIC ACCOUNTANTS



A MEMBER OF ARTHUR YOUNG INTERNATIONAL

Arthur Young

2175 North California Blvd.
Walnut Creek, California 94596
Telephone 415-977-2900

The Board of Directors
Sybase, Inc.

We have examined the accompanying balance sheet of Sybase, Inc. at December 31, 1986 and 1985, and the related statements of operations, shareholders' equity and changes in financial position for the years then ended. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the statements mentioned above present fairly the financial position of Sybase, Inc. at December 31, 1986 and 1985, and the results of operations and changes in financial position for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis during the period.

Arthur Young & Company

February 13, 1987

SYBASE, INC.

BALANCE SHEET

December 31, 1986 and 1985

<u>ASSETS</u>			<u>LIABILITIES AND SHAREHOLDERS' EQUITY</u>	
	<u>1986</u>	<u>1985</u>	<u>1986</u>	<u>1985</u>
Current assets:			Current liabilities:	
Cash	\$ 422,000	\$ 202,000	Accounts payable and accrued liabilities	\$ 220,000 \$ 61,000
Short-term cash investments	3,581,000	761,000	Accrued compensation and related expenses	189,000 98,000
Contract revenue receivable - related party (Note 2)	25,000	250,000	Deferred revenue (Note 2)	179,000 -
Accounts receivable	171,000	-	Note payable due within one year (Note 3)	5,000 -
Other receivables	129,000	55,000	Total current liabilities	593,000 159,000
Other current assets	<u>100,000</u>	<u>10,000</u>	Note payable due after one year (Note 3)	94,000 -
Total current assets	4,428,000	1,278,000	Shareholders' equity (Note 4):	
Restricted cash (Note 5)	100,000	100,000	Series A preferred stock, no par value, 3,947,367 shares authorized, issued and outstanding; liquidation preference of \$1,500,000	1,494,000 1,494,000
Equipment and improvements:			Series B preferred stock, no par value, 4,999,998 shares authorized, issued and outstanding (1985 - none); liquidation preference \$3,250,000	3,228,000 -
Computer equipment	100,000	16,000	Series C preferred stock, no par value, 2,515,000 shares authorized, issued and outstanding (1985 - none); liquidation preference of \$2,515,000	2,495,000 -
Furniture and fixtures	44,000	6,000	Common stock, no par value; 20,000,000 shares authorized; 5,504,697 shares issued and outstanding (1985 - 4,979,000)	131,000 51,000
Leasehold improvements	<u>255,000</u>	<u>8,000</u>	Accumulated deficit	(2,994,000) (227,000)
399,000	30,000	Notes receivable from shareholders	(78,000) (31,000)	
Less accumulated depreciation and amortization	<u>32,000</u>	<u>2,000</u>	Total shareholders' equity	4,276,000 1,287,000
Net equipment and improvements	367,000	28,000		\$ 4,963,000 \$1,446,000
Other assets	68,000	40,000		
	<u>3,963,000</u>	<u>\$1,446,000</u>		

See accompanying notes.

SYBASE, INC.

STATEMENT OF OPERATIONS

Years ended December 31, 1986 and 1985

	<u>1986</u>	<u>1985</u>
Revenues:		
Contract - related party (Note 2)	\$ 800,000	\$1,262,000
Porting and other contract services (Note 2)	66,000	4,000
Software license fees	<u>265,000</u>	<u>-</u>
Total revenues	1,131,000	1,266,000
Cost and expenses:		
Research, development and programming	2,249,000	1,020,000
Marketing	925,000	221,000
General and administrative	<u>848,000</u>	<u>284,000</u>
Total costs and expenses	<u>4,022,000</u>	<u>1,525,000</u>
Operating loss	(2,891,000)	(259,000)
Interest income, net of interest expense of \$2,000 in 1986 (1985 - \$3,000)	<u>124,000</u>	<u>63,000</u>
Net loss	<u><u>\$ (2,767,000)</u></u>	<u><u>\$ (196,000)</u></u>

See accompanying notes.

SYNASE, INC.

STATEMENT OF SHAREHOLDERS' EQUITY

Years ended December 31, 1986 and 1985

	Series A Preferred Stock		Series B Preferred Stock		Series C Preferred Stock		Common Stock		Accumulated deficit	Notes receivable from shareholders	Total shareholders' equity
	Shares	Amount	Shares	Amount	Shares	Amount	Shares	Amount			
Balances at December 31, 1984	-	\$ -	-	\$ -	-	\$ -	3,940,000	\$ -	\$ (31,000)	\$ -	\$ (31,000)
Sale of common shares for cash	-	-	-	-	-	-	95,000	2,000	-	-	2,000
Conversion of notes payable into Series A preferred stock	105,263	40,000	-	-	-	-	-	-	-	-	40,000
Sale of Series A preferred stock, less expenses of \$6,000	3,842,104	1,454,000	-	-	-	-	-	-	-	-	1,454,000
Common shares issued on exercise of options, less shareholders' notes receivable	-	-	-	-	-	-	989,000	51,000	-	(31,000)	20,000
Repurchase of common shares	-	-	-	-	-	-	(45,000)	(2,000)	-	-	(2,000)
Net loss for the year	-	-	-	-	-	-	-	-	(196,000)	-	(196,000)
Balances at December 31, 1985	3,947,367	1,494,000	-	-	-	-	4,979,000	51,000	(227,000)	(31,000)	1,287,000
Sales of Series B preferred stock, less expenses of \$22,000	-	-	4,999,998	3,228,000	-	-	-	-	-	-	3,228,000
Sales of Series C preferred stock, less expenses of \$20,000	-	-	-	-	2,515,000	2,495,000	-	-	-	-	2,495,000
Common stock issued on exercise of options less shareholders' notes receivable	-	-	-	-	-	-	875,000	97,000	-	(62,000)	35,000
Repurchase of common shares	-	-	-	-	-	-	(349,303)	(17,000)	-	15,000	(2,000)
Net loss for the year	-	-	-	-	-	-	-	-	(2,767,000)	-	(2,767,000)
Balances at December 31, 1986	3,947,367	\$1,494,000	4,999,998	\$3,228,000	2,515,000	\$2,495,000	5,504,697	\$131,000	\$(2,994,000)	\$(78,000)	\$ 4,276,000

SYBASE, INC.

STATEMENT OF CHANGES IN FINANCIAL POSITION

Years ended December 31, 1986 and 1985

	<u>1986</u>	<u>1985</u>
Applications of working capital:		
Operations:		
Net loss	\$2,767,000	\$ 196,000
Depreciation and amortization, charges not requiring working capital	<u>31,000</u>	<u>1,000</u>
Used by operations	2,736,000	195,000
Additions to property and equipment	370,000	-
Increase in restricted cash	-	100,000
Increase in deposits and other assets	<u>28,000</u>	<u>40,000</u>
Total applied	3,134,000	335,000
Sources of working capital:		
Furniture and equipment transferred to lease agreement	-	49,000
Issuance of note payable	94,000	-
Sale of preferred stock, net of issuance costs	5,723,000	1,494,000
Issuance of common stock, net of repurchases and shareholders' notes receivable	<u>33,000</u>	<u>20,000</u>
Total sources	<u>5,850,000</u>	<u>1,563,000</u>
Increase in working capital (Note 6)	<u>\$2,716,000</u>	<u>\$1,228,000</u>

See accompanying notes.

SYBASE, INC.

NOTES TO FINANCIAL STATEMENTS

December 31, 1986

1. The Company

Sybase, Inc. (Sybase or Company) was incorporated in December 1984 to design, develop and market high performance software for relational database management systems for on-line applications. At December 31, 1986, Sybase has completed the research and development of its initial product and is in the process of developing additional products and customizing (porting) its first product to function on computer hardware of various equipment manufacturers.

2. Accounting policies

Revenue recognition

Contract revenue results from a research, development and technology licensing agreement with a preferred shareholder. Revenue is recognized based upon the attainment of benchmarks specified in the contract terms.

Porting and other contract service (primarily technical support) revenues are recognized on a percentage-of-completion basis and ratably over the term of the support agreement (generally, one year), respectively. At December 31, 1986, the Company has deferred \$155,000 (1985 - none) and \$24,000 (1985 - none) of porting and technical support revenue, respectively.

Software license fees represent sales of the Sybase product to end-users.

SYBASE, INC.

NOTES TO FINANCIAL STATEMENTS

December 31, 1986

2. Accounting policies (continued)

Short-term cash investments

Short-term cash investments consist of time certificates of deposit and commercial paper and are stated at cost which approximates market.

Depreciation and amortization

Depreciation of equipment, furniture and fixtures is provided by the straight-line method over an estimated useful life of five years. Leasehold improvements are amortized on a straight-line basis over the shorter of the lease term or the estimated useful lives of the improvements.

Tax carryforwards

At December 31, 1986, Sybase has a net operating loss carryforward for financial and federal income tax reporting purposes of approximately \$2,990,000 and investment and research and development tax credit carryforwards of \$180,000 available to reduce future federal income taxes payable. Such carryforwards and credits expire principally in 2001.

Investment tax credits will be accounted for under the "flow-through" method (none in 1986 and 1985).

SYBASE, INC.

NOTES TO FINANCIAL STATEMENTS

December 31, 1986

3. Note payable

At December 31, 1986 Sybase has an unsecured note payable to the lessor of its office facility in the principal amount of \$99,000. The principal balance is due in monthly installments of \$1,500 through September 1996 including interest at 12.75%. The note payable matures as follows: 1987 - \$5,000; 1988 - \$6,000; 1989 - \$7,000 1990 - \$8,000; 1991 - \$9,000; thereafter \$64,000.

4. Shareholders' equity

In August 1986, Sybase's articles of incorporation were amended to increase authorized preferred stock from 5,000,000 shares to 11,462,365 shares.

Preferred stock

The holders of Series A, Series B and Series C preferred stock have voting rights equivalent to the number of shares into which each preferred share is convertible and are entitled to non-cumulative, annual dividends of \$.038, \$.065 and \$.10 per share respectively out of any funds legally available, plus any dividends declared on common stock on an as-converted basis.

Subject to certain antidilution provisions, each share of preferred stock is convertible, at any time, into one share of common stock, and is automatically converted in the event of a public offering of Sybase's common stock at a price per share of not less than \$4.00 and an aggregate offering price of greater than \$5,000,000.

SYBASE, INC.

NOTES TO FINANCIAL STATEMENTS

December 31, 1986

4. Shareholders' equity (continued)

Preferred stock (continued)

In the event of liquidation or winding-up, the holders of Series A, Series B and Series C preferred stock are entitled to receive a liquidation preference of \$.38, \$.65 and \$1.00 per share, respectively, plus any declared but unpaid dividends.

Common stock

Under Sybase's stock option plan, options to purchase 1,889,474 shares of common stock were reserved for grant to officers, employees and consultants. Options are to be granted, subject to certain restrictions, at an exercise price not less than fair market value (as determined by the Board of Directors) at the date of a grant and are immediately exercisable. Shares issued vest based on the shareholder's continued employment. Unvested shares are subject to repurchase by Sybase, at the original purchase price, upon termination of the shareholder's employment.

SYBASE, INC.

NOTES TO FINANCIAL STATEMENTS

December 31, 1986

4. Shareholders' equity (continued)

Common stock (continued)

Stock option activity is as follows:

	<u>Options</u>		
	<u>Price per share</u>	<u>Outstanding</u>	<u>Available for grant</u>
Balances at December 15, 1984		-	1,889,474
Granted	\$.05	1,029,000	(1,029,000)
Exercised	.05	(989,000)	-
Repurchase of common shares exercised under stock option plan	-	-	25,000
Cancelled	<u>.05</u>	<u>(40,000)</u>	<u>40,000</u>
Balances at December 31, 1985	-	-	925,474
Granted	.08 - .15	885,000	(885,000)
Exercised	.08 - .15	(875,000)	-
Repurchase of common shares exercised under stock option plan	.05 - .15	-	336,392
Cancelled	<u>.15</u>	<u>(10,000)</u>	<u>10,000</u>
Balances at December 31, 1986	<u>\$ -</u>	<u>-</u>	<u>386,866</u>

SYBASE, INC.

NOTES TO FINANCIAL STATEMENTS

December 31, 1986

4. Shareholders' equity (continued)

Common stock (continued)

Pursuant to a stock restriction agreement, 3,065,989 shares of common stock owned by officers and employees at December 31, 1986, are subject to repurchase by Sybase, at the original purchase price, upon termination of the shareholder's employment. The number of shares subject to repurchase decreases based on the shareholder's continued employment.

Warrants

At December 31, 1985, warrants were outstanding to purchase 200,000 shares of the Company's common stock at \$.38 per share through June 1990. During 1986 the Company issued warrants to purchase 192,308 shares at \$.65 per share exercisable through September 1991. In August 1986 all such warrants previously issued were exchanged for new warrants to purchase an aggregate of 392,308 shares at \$.10 per share exercisable in whole or in part at any time prior to the expiration date of the previously issued warrants.

Notes receivable from shareholders

Notes receivable from shareholders result from the purchase of common stock. Such notes are due in varying amounts through 1990, plus interest at 9%, and are secured by certain shares of common stock.

SYBASE, INC.

NOTES TO FINANCIAL STATEMENTS

December 31, 1986

5. Commitments

Under a lease agreement, Sybase has leased furniture and equipment with an aggregate cost of \$1,500,000. Future minimum lease payments, subject to certain rate adjustments, are due as follows:

<u>Fiscal year</u>	
1987	\$ 567,000
1988	486,000
1989	<u>230,000</u>
	<u>\$1,283,000</u>

Sybase leases its office facility under a noncancelable operating lease. Under certain circumstances, the lease can be cancelled in 1989. The lease is secured by a \$20,000 security deposit and a letter of credit which is secured by a certificate of deposit in the amount of \$100,000. The Company also has operating lease commitments for sales office facilities requiring minimum monthly payments of \$3,000 through December 1987. Future minimum lease payments are as follows:

<u>Fiscal year</u>	
1987	\$ 342,000
1988	504,000
1989	504,000
1990	504,000
1991	<u>504,000</u>
	<u>\$2,358,000</u>

Rent expense amounted to approximately \$599,000 in 1986 (1985 - \$233,000).

SYBASE, INC.

NOTES TO FINANCIAL STATEMENTS

December 31, 1986

6. Changes in components of working capital

The increases (decreases) in current assets and current liabilities are as follows:

	<u>1986</u>	<u>1985</u>
Cash	220,000	\$ 925,000
Short-term investments	2,820,000	-
Contract revenue receivable	(225,000)	250,000
Accounts receivable	171,000	-
Other receivables	74,000	54,000
Other current assets	<u>90,000</u>	<u>10,000</u>
	3,150,000	1,239,000
Accounts payable and accrued liabilities	159,000	(36,000)
Accrued compensation	91,000	87,000
Deferred revenue	179,000	-
Note payable	<u>5,000</u>	<u>(40,000)</u>
	<u>434,000</u>	<u>11,000</u>
Increase in working capital	<u>\$2,716,000</u>	<u>\$1,228,000</u>

SYBASE, INC.
STATEMENT OF OPERATIONS
July 31, 1987
(\$000)

	Projected	Actual	Variance
REVENUE			
DataServer	\$ 180	158	(22)
DataToolset	120	165	45
Training	4	8	4
Contracts	100	87	(13)
Royalties	80	0	(80)
Maintenance	8	16	8
Documentation	4	8	4
Total Revenue	496	442	(54)
DIRECT R&D EXPENSE			
Engineering	118	92	26
Technical Services	83	57	26
Other Product Expense	118	116	2
Total Direct	319	265	54
INDIRECT EXPENSE			
Marketing	138	139	(1)
Sales	174	253	(79)
Administration	100	90	10
Operations	36	29	7
Total Indirect	448	511	(63)
Total Expense	767	776	(9)
Operating Income (loss)	(271)	(334)	(63)
Interest Income	10	5	(5)
Interest Expense	0	1	(1)
Net Income (loss)	\$ (261)	(330)	(69)

Income Item () = Under Projected

Expense Item () = Over Projected



SYBASE, INC.
 YTD STATEMENT OF OPERATIONS
 July 31, 1987
 (\$000)

REVENUE (Revised Projection)	Projected	Actual	Variance
DataServer	\$ 719	666	(53)
DataToolset	478	542	64
Training	13	16	3
Contracts	788	767	(21)
Royalties	80	0	(80)
Maintenance	47	63	16
Documentation	6	22	16
Total Revenue	2,131	2,076	(55)
DIRECT EXPENSE			
Engineering	889	770	119
Technical Services	907	779	128
Other Product Expense	573	564	9
Total Direct	2,369	2,113	256
INDIRECT EXPENSE			
Marketing	813	773	40
Sales	993	1,461	(468)
Administration	652	656	(4)
Operations	184	175	9
Total Indirect	2,642	3,065	(423)
Total Expenses	5,011	5,178	(167)
Operating Income (loss)	(2,880)	(3,102)	(222)
Interest Income	78	89	11
Interest Expense	0	7	(7)
Net Income (loss)	\$ (2,802)	(3,020)	(218)

SYBASE, INC.
Summary Detailed Expenses Statement
July 31, 1987

AC# DESCRIPTION	CURR BUDGET	CURR ACTUAL	VARIANCE
05-Gross Salaries	\$ 376,260	388,594	(12,334)
09-Severance	2,915	0	2,915
10-Sick Leave	0	0	0
13-16-Payroll Taxes	33,859	27,343	6,516
20-Vacation	15,147	15,649	(502)
28-Health & Dental	18,699	18,182	517
29-Worker's Comp.	3,293	1,542	1,751
TOTALS	450,173	451,310	(1,137)
22-Misc Emp Benefits	0	72	(72)
24-Relocation	7,410	5,371	2,039
07-Bonuses	26,625	10,442	16,183
08-Temporary Help	2,814	114	2,700
25 & 26-Emp. Morale	9,385	3,758	5,627
27-Recruiting	37,851	18,769	19,082
61-Auto	3,898	2,554	1,344
62 & 63-Travel	33,095	29,696	3,399
31-Training & Seminars	4,166	5,397	(1,231)
32-Trade Shows	0	0	0
33-Public Relations	5,000	3,500	1,500
34-Marketing Research	1,000	1	999
35-Sales Leads	2,500	2,652	(152)
36-Collateral Productions	5,417	1	5,416
37-Advertising & Promo	7,500	30,212	(22,712)
64-Entertainment	1,541	2,499	(958)
40-Legal	4,600	3,510	1,090
41-Audit/Accounting	1,320	0	1,320
42-Consulting	9,321	12,001	(2,680)
43-Outside DP Service	1,377	395	982
49-Other Purchased Service	1,501	4,954	(3,453)
50-Office Supplies	5,705	6,218	(513)
51-Equip./Small Tools	4,056	468	3,588
52-Computer Supplies	412	826	(414)
53-Forms & Printing	1,980	19,583	(17,603)
54-Photocopying-Outside	2,530	2,584	(54)
55-Postage	3,682	4,085	(403)
57-Purchased SW	777	0	777
60-Freight	940	1,916	(976)
65-Subscriptions & Dues	2,279	2,428	(149)
67-Business License	392	600	(208)
69-Misc. Expenses	890	461	429
70-Training	6,247	2,478	3,769
80-Depreciation	3,686	7,438	(3,752)
81-Property Taxes	1,935	0	1,935
83-Insurance (Fire & Liability)	2,707	3,316	(609)
84-Telephone	7,784	20,668	(12,884)
85-Utilities	9,184	5,637	3,547
86-Rent	38,030	54,035	(16,005)
87-Rent, Equipment	79,564	93,732	(14,168)
88-Janitorial & Maint.	2,000	3,210	(1,210)
89-Equip Maint & Repair	8,152	6,307	1,845
90-Amortization	0	251	(251)
93-Moving	0	0	0
98-Capitalized S/W Alloctn	(86,364)	(86,364)	0
99-Project Alloc.-Overhead	(63,732)	(77,400)	13,668
9920-State Income Tax	0	0	0
50XX-Product Expense	117,543	116,597	946
TOTALS	\$ 766,873	776,282	9,409

SYBASE, INC.
YTD DETAILED EXPENSES STATEMENT

July 31, 1987

AC# DESCRIPTION	YTD BUDGET	YTD ACTUAL	VARIANCE
05-Gross Salaries	\$ 2,386,496	2,350,673	35,823
09-Severance	20,235	0	20,235
10-Sick Leave	0	4,484	(4,484)
13-16-Payroll Taxes	214,678	198,592	16,086
20-Vacation	96,378	93,703	2,675
28-Health & Dental	108,586	105,909	2,677
29-Worker's Comp.	20,643	14,624	6,019
TOTALS	2,847,016	2,767,985	79,031
22-Misc Emp Benefits	0	398	(398)
24-Relocation	38,690	34,381	4,309
07-Bonuses	56,247	44,785	11,462
08-Temporary	19,330	10,996	8,334
25 & 26-Emp. Morale	63,909	20,542	43,367
27-Recruiting	182,025	276,152	(94,127)
61-Auto	22,015	13,472	8,543
62 & 63-Travel & Meals	190,244	213,189	(22,945)
31-Training & Seminars	29,162	30,701	(1,539)
32-Trade Shows	0	250	(250)
33-Public Relations	35,000	39,201	(4,201)
34-Marketing Research	7,000	0	7,000
35-Sales Leads	7,498	7,079	419
36-Collateral Productions	37,919	12,872	25,047
37-Advertising & Promo	52,500	161,764	(109,264)
64-Entertainment	9,470	14,127	(4,657)
40-Legal	32,200	34,597	(2,397)
41-Audit/Accounting	9,690	8,936	754
42-Consulting	60,823	44,020	16,803
43-Outside DP Service	9,188	4,167	5,021
49-Other Purchased Service	9,959	18,418	(8,459)
50-Office Supplies	36,165	47,923	(11,758)
51-Equip./Small Tools	25,329	6,110	19,219
52-Computer Supplies	2,269	7,298	(5,029)
53-Forms & Printing	13,292	35,446	(22,154)
54-Photocopying-Outside	15,959	11,657	4,302
55-Postage	22,291	24,545	(2,254)
57-Purchased SW	5,289	481	4,808
60-Freight	5,865	6,839	(974)
65-Subscriptions & Dues	15,026	11,030	3,996
67-Business License	2,878	5,581	(2,703)
69-Misc. Expenses	5,938	3,731	2,207
70-Training	41,875	27,460	14,415
80-Depreciation	23,122	49,489	(26,367)
81-Property Taxes	14,200	3,206	10,994
83-Insurance(Fire & Liability)	16,959	15,092	1,867
84-Telephone	48,802	97,007	(48,205)
85-Utilities	63,570	34,288	29,282
86-Rent	233,084	287,222	(54,138)
87-Rent, equipment	469,004	550,032	(81,028)
88-Janitorial & Maint.	14,000	13,508	492
89-Equip. Maint. & Repair	50,540	70,578	(20,038)
90-Amortization	0	5,452	(5,452)
93-Moving	0	1,891	(1,891)
98-Capitalized S/W Alloctn	(86,364)	(86,364)	0
99-Project Alloc.-Overhead	(320,569)	(373,739)	53,170
9920-State Income Tax	0	75	(75)
50XX-Product Expense	573,038	564,299	8,739
TOTALS	\$ 5,011,447	5,178,169	(166,722)

SYBASE, INC.
BALANCE SHEET
July 31, 1987
ASSETS

Cash	587,084	
Accounts Receivable	1,082,983	
Pre-Paid	187,830	
Inventories	0	
TOTAL CURRENT ASSETS:		1,857,897
Property & Equipment	448,431	
Depreciation	(74,434)	
Net	373,997	
Long-Term Deposits		162,991
Capitalized Software	86,364	
Amortization	(2,399)	
Net		83,965
Other Assets	31,348	
Amortization	(10,595)	
Net		20,753
TOTAL LONG TERM ASSETS		641,706
TOTAL ASSETS		2,499,603

LIABILITIES and SHAREHOLDER'S EQUITY

Bank Borrowings	0	
Leases Current	0	
Accounts Payable	238,835	
Accrued Liabilities	231,298	
Customer Deposits	548,000	
Deferred Revenue (Maint)	115,884	
TOTAL CURRENT LIABILITIES		1,134,017
Long-Term Loan	90,273	
TOTAL L-TERM LIABILITIES		90,273
TOTAL LIABILITIES		1,224,290
SHAREHOLDER'S EQUITY:		
Preferred A Stock (Net)	1,493,936	
Preferred B Stock (Net)	3,228,386	
Preferred C Stock (Net)	2,492,699	
Common Stock	170,427	
Additional Paid-in Capital, Warrants	4,750	
Stockholder's Notes Receivable	(100,947)	
Retained Earnings		
Prior	(5,684,211)	
Current	(329,727)	
TOTAL EQUITY		1,275,313
TOTAL LIABILITIES & EQUITY		2,499,603
CURRENT RATIO	1.29	
ACID TEST	.70	
DEBT RATIO	.47	
WORKING CAPITAL	\$ 245,804	

SYBASE, INC.
CASH REPORT
July 31, 1987

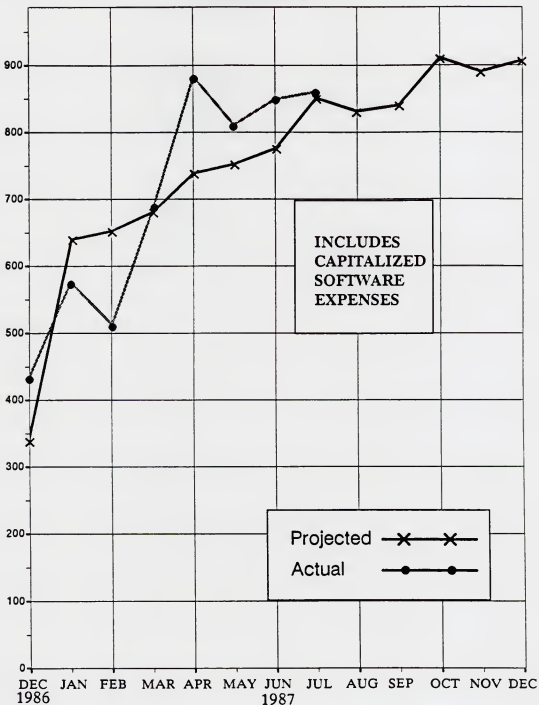
Balance at beginning of month		\$ 1,579,613
Cash received by sources		
Operations		
Contract	151,615	
Accounts Receivable	83,867	
Other		
Employee Common Stock	1,225	
Misc.	830	
Interest Income	6,646	
TOTAL RECEIVED		244,183
TOTAL CASH AVAILABLE		1,823,796
Cash distribution by classification		
Operating costs	46,047	
Payroll	681,938	
Rent, Building	56,197	
Utilities	14,196	
Recruiting	21,168	
Travel	26,794	
Promotion	11,965	
Health Insurance	18,346	
Assets	15,672	
Equipment Maintenance	20,667	
Equipment Rental	86,116	
Computer Supplies	6,963	
Consulting	18,374	
Outside Printing	20,816	
Legal	5,029	
Sales Tax Liability	12,489	
Relocation Expense	18,321	
Insurance	30,114	
CASH DISBURSED		1,111,212
Balance at end of month		\$ 712,584
Projected Balance		1,264,730
Variance		\$ (552,146)

SYBASE, INC.
 STATEMENT OF CHANGES IN FINANCIAL POSITION
 MONTH ENDED July 31, 1987

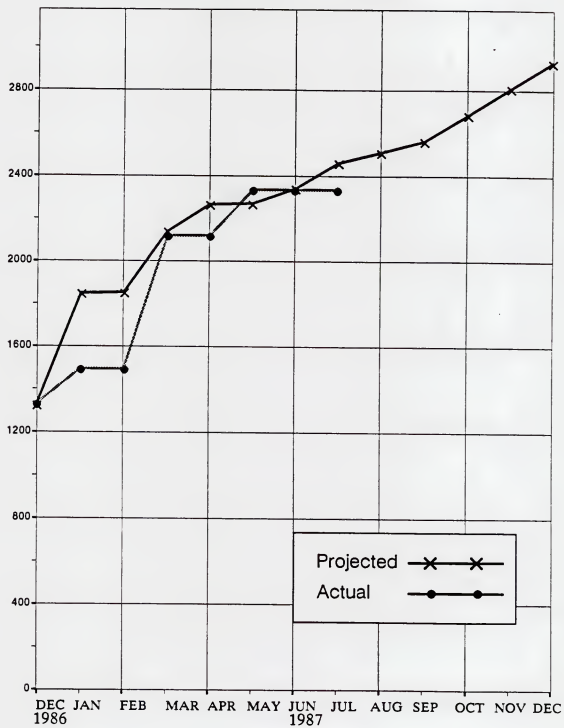
Sources of Working Capital	July, 1987
Funds Provided by:	
Operations:	
Net Income (loss)	(329,727)
Add items not requiring the current use of funds:	
Depreciation & Amortization	10,125
TOTAL from Operations	(319,602)
Other:	
Decrease in Long-Term Deposits	1,525
Increase in Accounts Payable	105,316
Increase in Customer Deposits	63,000
Increase in Deferred Revenue	12,215
Decrease in Stockholder's Receivable	1,225
TOTAL from Other	183,281
TOTAL Funds Provided	(136,321)
Applications of Working Capital	
Funds used for:	
Increase in Accounts Receivable	283,884
Increase in Pre-Paid Expenses	68,298
Increase in Fixed Assets	4,782
Increase in Capitalized S/W	86,364
Decrease in Accrued Liabilities	285,534
Decrease in Loan Long Term	513
Decrease in Preferred C Stock	1,333
TOTAL Funds Used	730,708
Increase (Decrease) in Cash, Securities	(867,029)
Cash & Securities Beginning of Month	1,579,613
Cash and Securities, End of Month	\$ 712,584

SYBASE TOTAL EXPENSES

(in thousands)

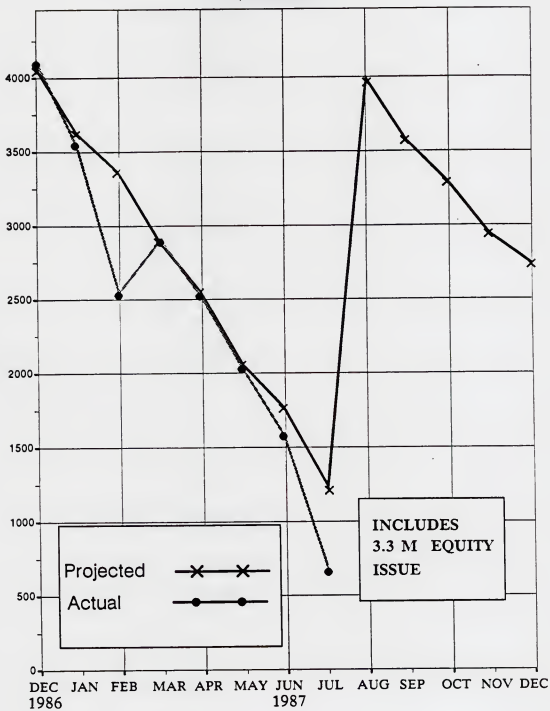


SYBASE CAPITAL/LEASED EQUIPMENT



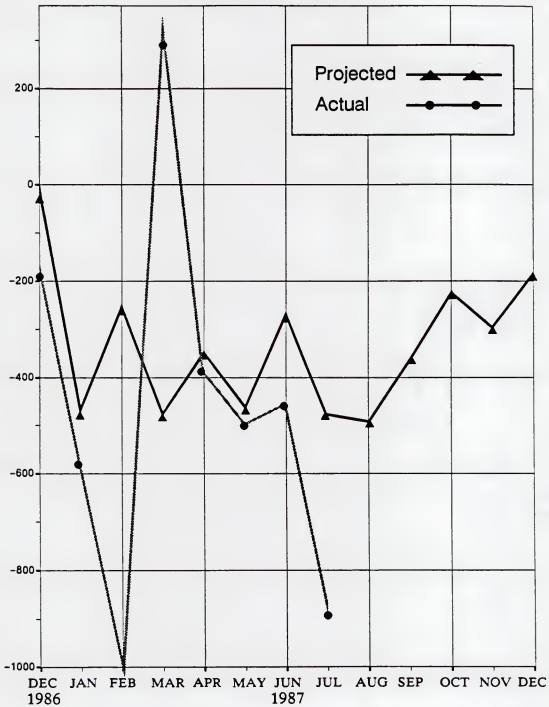
SYBASE CASH BALANCE

(in thousands)



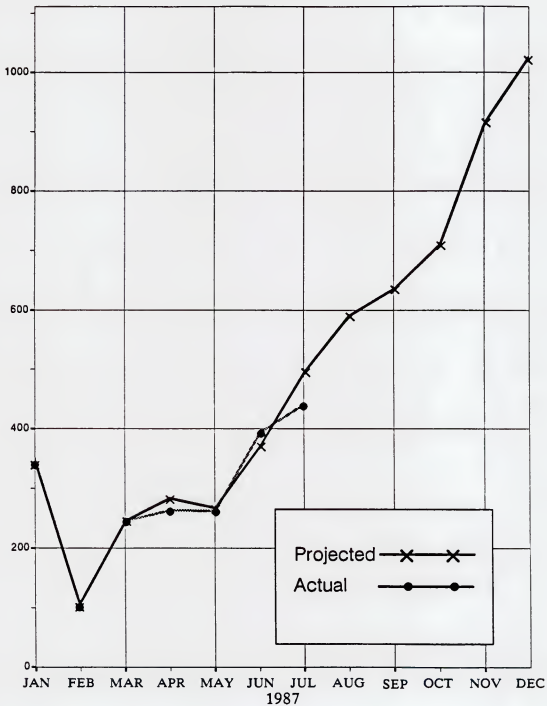
SYBASE CASH FLOW

(in thousands)



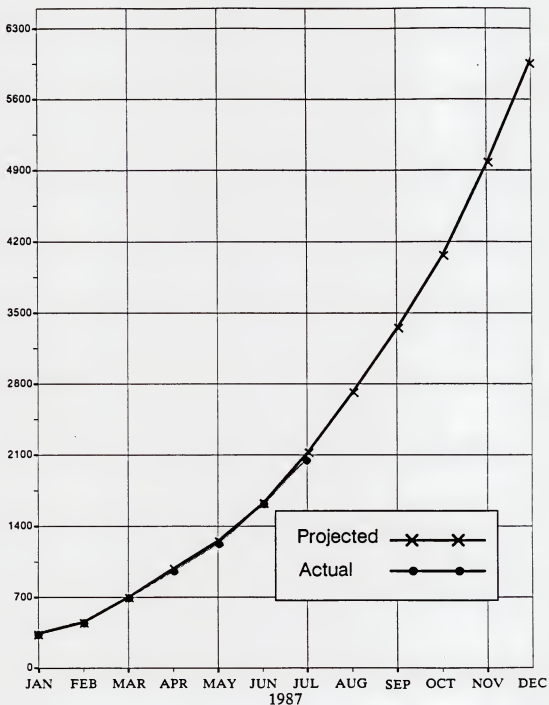
SYBASE MONTHLY REVENUE

(in thousands)



SYBASE CUMULATIVE REVENUE

(in thousands)



SYBASE CASH FLOW
3 Month Projection
(\$000)

	Aug	Sept	Oct
Beginning cash	712	3,580	3,341
+ cash from operations			
sales	151	491	500
contracts	50	117	50
Royalties	0	100	100
interest	22	20	20
+ cash from other sources			
capital lease	50	0	0
equity issue	3,300	0	0
TOTAL CASH ADDED	3,573	728	670
- cash uses			
capital expenditures	25	25	25
cash op exp, fixed	430	681	751
cash op exp, net 30	250	261	290
TOTAL USES	705	967	1,066
= ending cash	3,580	3,341	2,945
Projected	3,831	3,471	3,250
Variance	(221)	(391)	(305)





SYBASE

Mark B. Hoffman
President
2910 Seventh Street - Suite 110
Berkeley, CA. 94710
(415) 548 - 4500

Professional Experience:

Broad background of business, financial and development management experience gained as Vice President of Operations at Britton Lee and through various other operations positions.

Employment History:

- 1984 - Sybase, Inc.
President and founder (November 1984).
- 1984 - 1984: Mark B. Hoffman, Consulting
Consultant (August 1984 - November 1984)
Consulting practice specializing in system design and database management.
- 1980 - 1984: Britton-Lee Inc.
Vice President of Operations - Responsible for all manufacturing operations and the Technical Services Group while the company grew from \$5 to \$21 million in sales. Responsible for closing the single largest Britton-Lee Inc. sale at that time for \$2.5 million. Played a key role in financial decisions during a period of negative cash flow.
Acting Vice President of Engineering - During the four months search for a replacement.
General Manager Technical Services Group - Organized an engineering service organization that included Hardware and Software Product Test, Computer Operations and Management Information Systems. The charter of this organization was to evaluate new products and engineering changes to ensure that product specifications and quality standards were met and that the mechanisms were in place for a smooth transition of the products into Manufacturing. An additional task was to maintain all computer equipment for the company and develop a company wide integrated MIS package using the IDM.



Director of Materials - Developed a Materials group in a start up environment while the company grew from \$0 to \$5M in sales. Responsible for all aspects of master scheduling, purchasing, production planning, production control, receiving, stores, shipping, inventory control and international and domestic traffic. Defined and implemented the first relational MRP package to be run on a backend processor.

1979 - 1980: Amdahl Corporation

Manufacturing Management Associate - Participated in a two year program designed to accelerate managerial skills and knowledge in the manufacturing environment.

Test Support and Quality Assurance - Coordinated the purchase, modification, test and shipment of test equipment to a French corporation which had subcontracted to build Amdahl Memory Storage Units. Monitored new product developments to determine test equipment or procedures required to support production. Assisted in preparing proposals and did the financial analysis on two major automated test systems.

Purchasing - Functioned as the Senior Buyer for all printed wiring boards and backpanels. Defined and implemented a Purchase Requisition Tracking System to automate tracking of company wide requisitions.

Production Control - Functioned as the Senior Production Control Planner in the Master Scheduling Department responsible for coordinating the final assembly of all sub-units in systems test and ensuring that throughput met the master schedule. Chaired marketing meeting to coordinate various company elements involved in system shipments.

1976 - 1978: Precision Toyota-Tucson, Arizona

Salesperson for new and used cars while getting MBA.

1969 - 1975: United States Army, Captain

Logistics Officer (Ft. Eustis, VA.) - Provided comprehensive logistics and planning support for a transportation battalion. Developed battalion budget and allocated funds.

Company Commander (Korea) - Commanded a light maintenance company of 156 men responsible for maintenance of electronic equipment and the warehousing or all repair parts for an infantry division. Received Army Commendation Medal.

Plans and Operations Officer (Ft. Carson, CO.) - Developed comprehensive logistics plans and strategies for Fort Carson. Member of the planning committee for the construction of all base facilities. Received Army Commendation Medal.

Education:

UNIVERSITY OF ARIZONA - Tucson, Arizona
Masters of Business Administration; emphases in Finance 1979

UNITED STATES MILITARY ACADEMY - West Point, New York
Bachelor of Science, General Engineering 1969
Emphasis in civil and ordinance engineering. Member of French and audio clubs,
varsity wrestling and intramural water polo.

Personal:

Married, Two Children, Excellent Health, Birthdate: November 9, 1946



SYBASE

Dr. Robert S. Epstein
Executive Vice President
2910 Seventh Street - Suite 110
Berkeley, California 94710
(415) 548 - 4500

Professional Experience:

Specialist in relational database management system implementation and application. Engineering management at project and departmental levels. Engineering design of both hardware and software. Extensive experience with Unix and with Ethernet. Systems integration and debugging. Systems test and diagnostics. Product marketing and sales presentation. Customer support and training. Key account management.

Employment History:

1984 - Sybase, Inc.

Executive Vice President and founder (November 1984).

1984 - 1984: Robert Epstein, Consulting

Consultant (May 1984 - November 1984)

Consulting practice specializing in system design and database management.

1979 -1984: Britton-Lee Inc.

Vice President Product Development (1980-1984)

Responsible for all software and hardware engineering activity managing a group of 30 engineers and a budget over \$2 million. Joined Britton-Lee at the start of the company and grew with it to an effective annual sales exceeding \$20 million. Managed key customer accounts. Developed customer training courses. Worked in conjunction with sales people to close major corporate accounts. Developed technical marketing presentations. Engineering projects included XNS based Ethernet hardware, disk mirroring, relational performance optimizations, future machine architectures, disk and tape hardware subsystems, IBM block multiplexor channel hardware, ECL custom processor design.

Director Software Development (1979-1980)

Led the original product design team for the IDM 500 - the first commercial relational database machine. Direct responsibility for relational software, "C" compiler, linker, assembler, and debugging environment.

SYBASE
2910 SEVENTH STREET - SUITE 110
BERKELEY, CALIFORNIA 94710
(415) 548-4500

1. 2

1976 - 1979: University of California at Berkeley

Chief Programmer

Project manager and chief programmer for *INGRES* - an experimental relational database management system. Managed a group of 10 graduate students and undergraduate work study students. Major job responsibility was programming, debugging and supporting the *INGRES* system.

Teaching Associate

Organized and taught courses on computer programming and supervised individual research for undergraduate students.

1974 - 1976: Pacific Gas and Electric

Software Engineer

Designed and implemented an operating system for real time control of a natural gas storage facility. Did applications programming in PL/1 on IBM 370 OS/MFT environment.

Education:

1976 - 1980: Ph.D. in Electrical Engineering and Computer Sciences from the University of California at Berkeley specializing in distributed database systems.

1974 - 1976: Masters in Electrical Engineering and Computer Sciences from the University of California at Berkeley specializing in computer architecture with an emphasis in memory controllers.

1970 - 1974: Bachelors of Science in Electrical Engineering and Computer Science from the University of California at Berkeley.

Publications:

Why Database Machines, Datamation, July 1983.

Query Processing Techniques for Distributed, Relational Database Systems, UMI Research Press, Ann Arbor, Michigan, 1982.

Design Decisions for the Intelligent Database Machine, AFIPS Conference Proceedings for the National Computer Conference, 1980.

Analysis of Distributed Database Processing Strategies, Proceedings of the Sixth International Conference on Very Large Databases, 1980, pp 92-101.

Query Processing in a Distributed Database Environment, Proceedings 1978 ACM SIGMOD Conference on the Management of Data, 1978, pp 169-180.

Personal:

Married, One Child, Excellent Health, Birthdate: May 15, 1952



SYBASE
David M. Turner

Education

UNIVERSITY OF SANTA CLARA - Santa Clara, California. Masters of Business Administration; emphasis in Finance, 1979.

SAN FRANCISCO STATE UNIVERSITY - San Francisco, California. Bachelor of Arts; Industrial/Organizational Psychology, emphasis in Design and Industry. Graduated CUM LAUDE, 1976.

Experience

1985-present SYBASE, INCORPORATED - Berkeley, California. Product - Database Server software and service. A relational database system.

Vice President of Finance and Operations - Responsible for all finance and accounting functions including monthly statements, budgets, credit and banking relations, taxes, and financial projections. In charge of purchasing, facilities, and personnel.

1980-1985 BRITTON LEE, INCORPORATED - Los Gatos, California. Product: Intelligent Database Machine (IDM). A relational database management system.

Director of Materials - Managed the material control, inventory control, production control, and purchasing functions of the manufacturing organization. Functions included developing material cost standards and variances, product pricing, physical inventory costing procedures, resolving accounts payable issues, and interfacing with the accounting and finance departments.

Production Control Manager - Developed a production and material control group in a start-up environment while the company grew from \$0 to \$20M in sales.

1979-1980 AMDAHL CORPORATION - Sunnyvale, California. Product: Amdahl 470. Large mainframe general purpose computer.

Manufacturing Management Associate - Selected to participate in a two year program to develop manufacturing skills and leadership ability while performing in a variety of assignments including purchasing, master scheduling, production planning, and cost accounting.

Member National Association of Accountants, American Management Association



SYBASE

PETER C. MORK
2517 Westford Way
Mountain View, CA 94040
Home: 415-962-0629
Office: 408-946-6200

- 1985-present RICOH SYSTEMS, INC.
Vice President, Marketing and Sales
Recruited to this Ricoh start-up venture to establish OEM and major account distribution in the US for Ricoh's office automation products.
- 1984-1985 COUNTERPOINT COMPUTERS
Vice President, Marketing
- 1972-1984 DATA GENERAL CORPORATION
- 1983-1984 Director, Marketing, Desktop Division
Responsible for selection, start-up and on-going support of 125 dealers. Formulated marketing strategy for the DG One Portable Computer.
- 1981-1983 Director, Japanese Business Development
Coordinated development and manufacturing start-up of the DG One Portable Computer by DG's then-new subsidiary Nippon-Data General.
- 1973-1980 Sales Management Summary
Qualified for Million Dollar Club seven of eight years, exceeded corporate revenue growth percentages every year, average growth in excess of 50% per year. Developed major corporate accounts: McAuto, AMI, Compusource/EDS. Hired and developed sales organization which had one of the highest promotion rates in the company. Initiated development of new corporate financial policies and contracts which facilitated selling to systems houses in Southern California.



SYBASE

Sales Positions:

1980-1981	Regional Sales Manager, Southwest
1977-1980	District Sales Manager, Los Angeles
1973-1977	Branch Sales Manager, Los Angeles
1972-1973	Sales Representative

Led district in signing new accounts.



SYBASE

RESUME

STEWART A. SCHUSTER

EDUCATION:

- 1967-1973 University of Illinois, Urbana-Champaign, Illinois
Ph.D., Computer Science
M.S., Applied Statistics
- 1963-1967 Washington University, St. Louis, Missouri
B.S., Applied Mathematics & Computer Science

WORK EXPERIENCE:

- 1/86-Present RELATIONAL TECHNOLOGY, INC.
Vice President, Business Development
Responsible for Distributed Data Base product introduction,
corporate partnerships, NSF-SBIR grants and technology acquisitions.
- 1985 PANORAMIC, INC.
Vice President, Technology
Responsible for product planning, engineering management, product support management and documentation management.
- 1983-1984 RELATIONAL TECHNOLOGY, INC.
Director of Marketing
Product Marketing Manager
Responsible for product introductions, product planning and management, documentation management, trade show and sales seminars; also responsible for corporate graphics, market communications, public relations and sales collateral to include corporate brochure, sales pitch, product data sheets, presentation folder and promotional items.
- 1978-1983 TANDEM COMPUTERS, INC.
Toronto Commercial Branch Sales Manager
Salesman and Sales Manager for all non-financial territory in Toronto and vicinity. Managed four salesmen with 1983 revenue goal of seven million. Served as Account Manager for Gulf Canada and Radio Shack Canada.
- Regional Systems Manager, Northwest Region
Manager of four district systems analyst managers, an education manager and a product support specialist manager. Total group over 40 people. Responsible for hiring, budgeting and special projects. Developed a special Design Support Marketing Program (The Template for Success) for reviewing customer applications. Helped develop two-day "Technical Enlightenment Seminars" on Tandem Products.



STEWART A. SCHUSTER

Page Two

Software Designer, Data Bases Development
Manager of data base and languages development. Responsible
for hiring, project management and product planning for data
dictionaries, query languages, utilities, compilers, program
development tools, and electronic mail. Also designed data
base marketing presentations.

1977-1978

INTEL CORPORATION

Senior Staff Engineer, Commercial Systems Division
Conducted feasibility study and business planning for the
development of a commercial version of RAP, evaluation of the
MRI acquisition by Intel.

1973-1977

UNIVERSITY OF TORONTO

Assistant Professor, Department of Computer Science and Faculty
of Management Studies
Promoted to Associate Professor while on leave. Responsibilities
included teaching and research, relational data bases,
data management systems, development of RAP - a Relational
Associative Processor, published over 15 papers and reports.

1967-1973

UNIVERSITY OF ILLINOIS

Programmer, Office of Administrative Data Processing
Application programming; Research Programmer, Illiac IV pro-
ject, compiler development; and Research Programmer, Center for
Advanced Computation, application programming, development of
Statistical packages, implementation of a geographical data
base system.



SYBASE, INC.

Industry Reference Interview

Date of Interview: August 25, 1987
Person Interviewed: Kimball Brown
Company: Data Quest
Phone Number: (408) 971-9000
Members Present: Rick Stubblefield

What is your opinion of the Sybase product?

I have seen it demonstrated. It has a good user front-end. It's very friendly, very similar to the MacIntosh. Its back-end, the data server, is uniquely architected which enables it to have extremely high throughput speed.

How is the product positioned on the market?

The product is positioned as an on-line relational database. It's the only relational database that has true on-line capability. However, the product has performance characteristics superior to other relational databases on the market. As such, it will also be sold directly against decision support products.

Who are Sybase's primary competitors?

Oracle and Ingres are its primary competitors. However, Oracle and Ingres lack throughput speed and on-line capabilities. Oracle and Ingres are formidable competitors that have huge installed bases. Sybase will have some difficulty displacing users of Oracle and Ingres database products. But, Oracle and Ingres have been sold primarily to small departments with three to four users. These programs overload with more users. Sybase can handle up to 100 users without performance degradation.

Is Britton Lee a competitor?

I suppose so. It is the only company capable of on-line performance. But Britton Lee has many problems right now. It sells a database machine, whereas Oracle, Ingres and Sybase sell database software that runs on general purpose hardware. Britton Lee is far more expensive because you have to buy special purpose hardware. No one wants to rely

on a small database company for hardware solutions. Data processing department managers would prefer to buy a DEC, Sun or IBM and install a database management system on it.

How difficult will it be for Sybase to penetrate the market?

I feel Sybase will be a major player in the mid range database market. Its software runs on Sun and Vax systems. In addition, Sybase has developed some strategic OEM relationships with Microsoft and Apple Computer. Next year, OS2 will be the operating environment in which most personal computers run. Microsoft is a major OS2 player, and Sybase has developed its software to be Microsoft's database manager. In addition, Apple just invested \$1.3 million in Sybase. Sybase's front-end looks just like the MacIntosh. And in all likelihood, Sybase will port its program to the MacIntosh and be the MacIntosh database manager. Sybase also has relationships with Pyramid, Metaphor and TRW. Sybase has all these different companies looking at them and investing lots of money. These companies think it's a hot product. I think it is as well.

Is relational or hierarchical the database structure of the future?

The market has been moving to relational for the last six years. Hierarchical is the old database structure that's used in many major corporations. However, I very rarely see new hierarchical databases being sold. Relational databases have been unable to match the performance of hierarchical until Sybase. Sybase is converting the relational dream into reality.

What is preventing Oracle and Ingres from separating their front-end and back-end?

Oracle and Ingres have huge installed bases. They cannot afford to ignore their installed bases at the expense of developing a new product. As a result, most of their effort goes into program maintenance rather than new product development. Separating the front- and back-ends would require a major rewrite of their program. Sybase has a two year lead.

How good is the management team at Sybase?

It's an outstanding management team. Bob Epstein, the system architect, was involved in the Ingres project while at Berkeley and spent several years at Britton Lee as its chief architect. He has built several systems before and is the driving force behind Sybase's uniqueness. I don't know Mark Hoffman very well, but based on what I've heard, he's also an outstanding manager.

In your opinion, will Sybase succeed?

I have no doubt they will succeed. Apple and TRW are major investors and Microsoft is a partner of the company. They have too many alliances going to not be successful. With the OS2 environment coming next year, it is positioned to take advantage of the change in market. I expect them to go public mid-1988 to late-1988.

SYBASE, INC.

Customer Reference Interview

Date Interviewed: August 25, 1987
Person Interviewed: Steve Tolchin
Company: Health Care 2000
Phone Number: (415) 661-4791
Present: Rick Stubblefield

How familiar are you with the Sybase database?

I've been using databases for over 20 years. For the last six years, I've been using Ingres relational database while Director of Technology at John Hopkins University. Last September, we agreed to be the beta test site for the Sybase product. My experience was a very positive one. John Hopkins will convert its databases over from Ingres to Sybase.

I came to Health Care earlier this year and have since purchased the Sybase product to use here. Both John Hopkins and Health Care need a high volume database. Neither Oracle nor Ingres can handle high volumes. Although we used those in the past, they were the only available product on the market. Sybase is uniquely architected and it enables high volume processing at superior throughput speeds. Sybase is at least two years ahead of its time.

What makes the Sybase software unique?

Sybase has separated the front-end application tools from the back-end processing. In so doing, they have put the data integrity and the read and write functions on the back-end. This is the key to high throughput speed in multi-user databases. All other databases on the market have the data integrity and the read and write functions as an integral part of the application tools. Sybase has a very good product.

Why did Sybase feel a need to address this sector of the market?

Bob Epstein, one of the co-founders of Sybase, worked on the Ingres project while at University of California at Berkeley and he later worked for Britton Lee. He was the technical architect for both systems. Britton Lee's approach to increased speed was to sell both the database and specialized hardware. The problem with the hardware is that Britton Lee is not capable of maintaining state-of-the-art hardware. Epstein learned from both Ingres and Britton Lee the needs of the database user market. Furthermore, his vision was to develop a general purpose high performance database management system to run on general purpose hardware that worked effectively in on-line and multi-user environments. Epstein has always been at the forefront of the industry.

Will the move out of hierarchical and into relational databases continue?

For the last six years hardly any new hierarchical databases have been sold. The hot new products are the relational databases. Relational is far more flexible and transfers the computing power into the hands of the user rather than the programmer. However, it lacks speed. What the database market has needed is a relational product that has high throughput speed and can effectively work in a multi-user environment. Sybase has effectively converted relational into reality.

Who are Sybase's primary competitors?

The two primary competitors are Oracle and Ingres. Oracle has a huge installed base and is the more serious competitor of the two. Oracle's product works across many different environments and is an all purpose product. Oracle has been committed to maintaining its database and providing adequate service to its customers. As such, it hasn't spent enough effort on research and development of new products. Ingres is fading fast and is not really a factor in the market anymore. Sybase has done a significant job of getting its product known in the community. Sybase has excellent publicity and is aligning itself with some key players. All of this will build up user confidence in the program and enable it to penetrate the market quicker.

Do Oracle or Ingres plan new products in the future?

Yes. In fact Oracle recently announced that it has a new product underway. However, it hasn't even begun writing the code yet and in order to bring the new product to market, it needs to rewrite approximately 45% of existing code. This will take Oracle approximately a year and a half to complete. After that, the product must be debugged.

Sybase is working with TRW to develop a secure database to be sold to the government. How significant is this?

I worked for the Pentagon for ten years when I was younger. The only way level B-2 security information can be adequately stored is in a safe. If someone were to come up with a secure database that could handle the needs of the Intelligence Departments of the government, they would become instantly rich. Sybase's work with TRW could be significant.

Is Britton Lee a competitor?

Technically yes, but Britton Lee is not going to be a factor in the market anymore. Britton Lee program requires special purpose hardware manufactured by Britton Lee. Britton Lee cannot keep up with state-of-the-art hardware developments and cannot benefit from general hardware improvements. People don't like that aspect of Britton Lee's product. The Sybase product has been built to run on general purpose hardware. In other words, whatever computer is being used, the Sybase product can run on it. Britton Lee has to maintain both its database software and the computer.

How is the Sybase product being positioned?

The product is being positioned as a high-performance on-line relational database. However, it serves a far broader range of markets than that. Stratus and Sybase have an OEM relationship. Stratus is dumping Oracle and will sell Sybase with every machine that it sells. Stratus sells full-tolerant (on-line) machines. Sybase has the high-end Unix market covered through its OEM relationship with Pyramid. Pyramid is basically a low-priced alternative to DEC. Sybase will not be able to, in my opinion, develop an OEM relationship with DEC because DEC has its own relational database system called Rdb. Sybase also has the low-end Unix addressed through the Sun relationship. Finally, they'll be on every desktop in America through its Microsoft and Apple computer relationships.

Would you recommend Sybase product to your peers?

Most definitely. I'd like to invest in Sybase.



SYBASE, INC.

Customer Reference Interview

Date Interviewed: August 25, 1987
Person Interviewed: Steve Lubow
Company: Space Telescope Science Institute
Phone Number: (301) 338-4826
Present: Rick Stubblefield

Background comments:

Steve is the database specialist on the Space Telescope project and is responsible for analyzing new databases and potential database applications. His group has a need for very powerful relational databases and is frustrated that products on the market today are not powerful enough. Steve talked to Sybase last year and agreed to be a beta test site. He was very impressed with the Sybase product and uses the system now. During beta test, they discovered several bugs that primarily dealt with data corruption. As a result, the product has yet to be put in a mission critical environment. Steve found that Sybase management was very supportive and worked effortlessly to debug the program.

What is special about Sybase's relational database management system?

Its product offers dramatic performance improvements over other relational database systems on the market today. Performance comes in two areas. The first is just in pure throughput speed. And the second is its ability to operate in a multi-user environment. Sybase also built its system to run on general purpose hardware. As such, the program is portable to most any type of hardware. This is significant because a user has hardware flexibility. I can choose the type of hardware I want, and when hardware is updated, Sybase products benefit from the increased performance of the underlying hardware. Britton Lee, for example, sells a database machine which has special purpose hardware.



Britton Lee must not only keep up with all technology developments in the software area but in addition must pay particular attention to keeping its hardware state-of-the-art.

Sybase architected its software such that traditional operating system functions are built into the software itself. For example, Sybase has its own filing system and scheduling and multi-tasking system. In a traditional database software program, these functions are handled by the computer's operating system. The operating system is a general purpose operating system that must handle multitudes of tasks. The operating system is not optimized for database management. Sybase's software operating system has been optimized to handle specific database management functions. Sybase has also built in many features into the system. For example, they support null values. No other system today supports null values. This is significant because most calculations cannot be done if the zero is entered into a field. For example, a weighted average. But if a null value is entered, the database knows how to handle it. Finally, it has built in referential integrity. A relational database management system is merely a set of tables that are all relational to one another. The problem with the relational database is if you delete a certain field that's related to fields in another table, the database has no way of deleting the related fields. As such there is frequent data pollution. Sybase has built into the program a mechanism which can delete these records. The Sybase system has also been built as a distributed system and will handle distributed queries. This is significant in the ever changing environment we deal in. We are planning on developing a database that has all the star (celestial) information. This database will be available to people throughout the world. By using the Sybase system, people in remote locations will be able to access our system and perform queries and updates against it. Sybase has also has excellent support. So far we have been very pleased with its level of customer support. Many database companies don't have adequate support.

Who are Sybase's primary competitors?

Its primary competitor, in my opinion, is BLI. However, I think BLI has serious problems and may not be around in the long run. BLI is in the database machine business. In order to use a BLI product, you must also purchase BLI hardware. BLI's problem is that hardware advance is far more rapid than it can keep up with. Sybase has a lower cost software that runs on general purpose hardware. Sybase yields much better price performance ratio than BLI. Its other primary competitor would be the Ingres product from Relational Technology Inc. However, RTI does not have anything that directly competes with Sybase. I have heard rumors that Ingres is about to introduce a new product, but I would expect product development to be a year and a half

lcs:CR12.SYB



away. Furthermore, the Ingres system does not handle more than a dozen users. System performance is extremely degraded with over five users. In order to achieve the multi-user environment Sybase is capable of addressing, it must reconfigure the entire system and separate the front and the back ends. The third primary competitor would be Oracle which is the front runner in the relational database market. However, it doesn't run on a Sun workstation. Oracle's primary success has been in small departments that have a maximum of four users that primarily do decision support applications. Oracle is also rumored to be coming out with a new product. But that is likely to be a year and a half away.

How sensitive are buyers to price?

Price is important, but it is not critical. Databases manage information for company and are perhaps their most critical asset. BLI is by far the most expensive database system on the market but it still sells product. The primary emphasis is on performance. Sybase, in my opinion, will be very competitive on price while offering superior performance.

How big is the relational database market?

It has the potential to be huge. Most people don't understand the need for complex databases. In my opinion, we're at the dawn of the database era.

Where does the speed of the Sybase product come from?

First of all, it has separated the front-end application process from the back-end read and write process. Secondly, it has developed its own operating system that files and schedules tasks which have been optimized to handle database functions. The third is that Sybase has written some very clever algorithms that process data far quicker than the competitors. The fourth is its use of stored procedures.

How would you rate the Sybase product overall?

The Sybase product has not been market tested and as such may still have bugs in it. However, I believe that it is the best database product available on the market today. Sybase has not done anything revolutionary, but what it has done is merely a natural progression of the industry. Sybase is the first of the new generation of database products. It is two years ahead of the competition. The product is very efficient and is clearly the direction in which the market needs to move. Its key to success will be penetrating the market while it has a two year lead.

What is magical about an on-line database?

On-line refers to the concept that the machine never has down-time and runs twenty-four hours a day. Nonetheless, the database always needs to be backed up. The problem is, how to keep the database on-line and maintain data integrity while doing a back-up. The trick is to write a real neat algorithm. Very few people have been able to do that, but Sybase has.

Why is the market moving out of hierarchical databases and into relational?

Relational databases are what people want. They are very user-friendly and have tremendous intrinsic power. They allow a user to ask any question of the database. The problem with relational is that it has lots of overhead. By this I mean that they have lots of tables joined by only indexes. In order to query or update a table or a database, a search of the entire database must be performed. This is very inefficient for large databases and one of the major drawbacks of the relational database. Hierarchical, on the other hand, stores data by fixed addresses. It is far more efficient to search and seek data in a hierarchical database. However, every time a change needs to be made to the configuration of the database, it requires a major rewrite. In addition, only specific questions can be asked of the database. In summary hierarchical databases have no flexibility. Sybase has brought the relational dream into reality. It is the first company that has been able to develop a relational database that has high throughput speed and tremendous efficiency.

Do you recommend to your peers to buy the Sybase product?

It depends. Sybase has a very new product and it has yet to be proven on the market. I'm concerned that it may have bugs that still need to be ironed out. As such, if a peer has a project that needs to be done within six months, I warn him that Sybase is new. However, if a customer is just looking for a good database product, I always recommend the Sybase product.

Would you invest in Sybase?

If Sybase was traded on the stock market, I'd most definitely buy some of its stock. Database companies are experiencing tremendous growth. Both Oracle and Ingres doubled in size last year.



SYBASE, INC.

Customer Reference Interview

Date of Interview: August 26, 1987
Person Interviewed: Charles Irby
Title: Vice President, Engineering
Firm: Metaphor
Phone Number: (415) 961-3600
Interviewed By: Rick Stubblefield

Will you please describe Metaphor's business?

We are a value-added reseller that develops and designs data interpretation systems and sells them to Fortune 500 companies. Most of our applications are used in decision support as opposed to on-line.

How many different RDBMSes do you sell?

We sell Oracle, Ingres and Britton Lee. We will be selling Sybase soon.

What is your opinion of the Sybase product?

Sybase has an excellent product. We are using it internally and plan to sell it as our primary database next year. We expect sales to be significant.

Will Sybase be one of your primary RDBMSes?

Yes, Sybase will be a significant RDBMS for us. We are building a brand new hardware system designed to take advantage of Sybase's benefits. The bulk of our revenue comes from selling database servers. Currently we sell mostly BLI and expect Sybase to overtake them next year.

Why is the Sybase product so significant?

Sybase has split the front-end application aspect from the back-end read and write aspect of software. In addition, it has written superior algorithms and, because of its system architecture, requires less memory. Sybase supports



many solutions; we feel we will have many sales from the use of the Sybase product. Metaphor serves a decision support niche and, although Sybase's product is primarily positioned as an on-line relational database, we will push it as our primary database management system.

Why would Metaphor select an on-line RDBMS as its primary product (Sybase's) when it only requires a decision support solution?

Although Sybase offers an on-line solution to RDBMS, it also offers dramatic performance improvements over existing decision support databases. It also serves a multi-user environment without performance degradation. I feel there will be tremendous demand for the Sybase product; we are counting on selling a lot of its product. Metaphor is committed to Sybase. That is evidenced by the fact that David Liddle, of our firm, sits on its Board.

Does Sybase have the ingredients to be successful?

Most definitely. Its biggest risk is a marketing risk. Having a good product alone is not sufficient in this market. You also need excellent marketing. To date, it has demonstrated a tremendous ability to generate positive publicity.

The other risk is that its competitors may develop a comparable product soon that narrows the performance advantage.



SYBASE, INC.

Customer Reference Interview

Date of Interview: August 26, 1987
Person Interviewed: Kwang-I Yu
Title: Chief Scientist
Firm: TRW
Phone Number: (213) 535-4910
Interviewed By: Rick Stubblefield

What is your opinion of the Sybase product?

I feel it is very good, although I have yet to spend a tremendous amount of time using it. My people are very happy with it. We have shipped certain aspects of the product to our government customers and they are very pleased. In my opinion, Sybase is two years ahead of its time. Sybase will be the premier database product on the market.

What is the nature of the TRW/Sybase product development contract?

Sybase is developing a high security database product for TRW. This product will be a B2 security level product. This level of security is approved by the NSA, the NSC, the CIA and other high security government agencies. Currently there is no database available on the market that has this level of security clearance. As a result, the government must lock key documents in safes and find other ways to store them. The potential size of the government market is huge. In addition, the government is not a price sensitive market sector. TRW sells hardware products to the government that cost hundreds of millions of dollars. Each system sold generates over \$7 million profit for us. We feel that by aligning ourselves with Sybase, it will give us a tremendous advantage over the competition. We will be able to offer our customers a high security, uncrackable database.

What does Sybase get out of the TRW relationship?

I can't comment on that too specifically because we are currently negotiating with them. However, I will say that it is in TRW's best interests to have the high security



product be a Sybase product. If it is a TRW product, the burden will be on TRW to update and maintain the database. TRW does not have database expertise. As a result, as Sybase moves ahead with technology, the TRW high security database would lag with respect to state-of-the-art product enhancements. It is in our best interest that Sybase has the right to market and profit from the high security database.

Aside from the high security aspect, why do you feel the Sybase product is significant?

First of all, it is the only on-line relational database available on the market. Other products claim to have this capability, but in actuality they lag immensely in performance. Sybase architected its system such that the back-end and the front-end are split. The front-end is its data tool set. It is very user friendly and it is an attractive selling feature. Other relational databases just don't address this aspect. As far as TRW is concerned, they have uniquely configured the system such that it has the ability to store text, geographical maps, and other types of information that most databases are unable to handle. Databases are generally configured in a tabular form and cannot handle volumes of text. Sybase has worked closely with us to develop this capability.

Outside of government, what will be the profit potential of the high security database

In my opinion, there will be tremendous profit potential. The banking and financial communities need high security databases. so computer hacks don't crack the system. Dunn and Bradstreet demands a high security system. TRW Financial Services group would love a high security system that is uncrackable. In my opinion, once it's developed, there will be a huge market out there.

Will Sybase be a significant player in the database market?

I feel they will. Its primary competitor, Oracle, claimed in an article recently that Sybase is its most dangerous competitor. TRW as a company, has tremendous faith in the Sybase product. As evidence of that, TRW is a major stockholder in Sybase and has spent \$2.8 million in product development contracts with them.

APPLE BUYS INTO SYBASE Apple Computer Inc. said Monday its Strategic Investment Group would co-invest in a \$3.3 million round of venture capital in Sybase Inc. of Berkeley. The Cupertino personal computer company's move is designed to support Sybase's development of its high performance database software for Apple's Macintosh computer line.

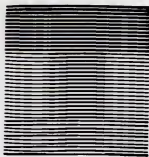
Sybase's program is used by corporate and government computer users, a market that Apple has been tapping with its Macintosh.

"What Sybase can bring to Apple customers complements our strategy to take the Macintosh into large corporations and to function with systems from many different vendors," said Dan Eilers, director of Apple's Strategic Investment Group. Other co-investors in the venture capital group are Hambrecht & Quist Venture Partners, TRW, Kleiner Perkins Caufield & Byers, Charles River Ventures and Oak Investment Partners.

IN BRIEF . . . SmithKline Beckman Corp. said it will enter the contact lens manufacturing business with the acquisition of International Hydron Corp., a worldwide manufacturer of contact lenses. . . . Australia will not tolerate a ban on its \$530 million beef trade with the United States, Primary Industries Minister John Kerin said Sunday. Kerin described the ban as "nonsense." . . . Sebastiani Vineyards said it has obtained an option to buy a 13.5-acre winery near Lodi owned by the Woodbridge Vineyard Association.

Compiled from Examiner staff and wire reports

8 Houston, Feb 27 11, 1982



Technologic Computer L E T T E R

Vol. 3, No. 26
August 3, 1987

THIS WEEK

COMPANY UPDATE

SYBASE INC.

Good early notices for a startup in on-line relational databases.

PAGES 2 TO 4

BY THE NUMBERS SYBASE INC.

Rising revenue forecast.
PAGE 2

Selected operating results.
PAGE 3

The major investors.
PAGE 3

Its financing history
PAGE 4

NEW ISSUES

TERADATA

A reconstruction of its financing history.

PAGE 4

Getting Organized

What's behind the rising revenues of the relational database companies? More data, more networks and more PC power

Not so long ago, the relational database was — well, a poor relation in the family of software. But lately it has come into its own, and, with a few exceptions, the companies based on relational technology are doing increasingly well.

Last week, Oracle Corp., which sells relational software, reported a 165% increase in annual earnings on a 137% rise in revenue. At rival Informix Corp., results for the first half showed similar gains. At Teradata, the database machine maker in the midst of an initial public offering, revenues are up almost three-fold and the company has been profitable for five consecutive quarters. Ansa Corp., publisher of Paradox, expects to break even this year. So does Sybase Inc., which makes a relational database for on-line applications. Metaphor Computer Systems, which supplies turnkey database tools to specific industries, has just finished its third quarter of steadily increasing profitability and is running at above a \$10 million per quarter rate in revenue. The principal exception is Britton-Lee, which has had two miserable quarters. This, despite the health of Metaphor, which is Britton-Lee's largest OEM.

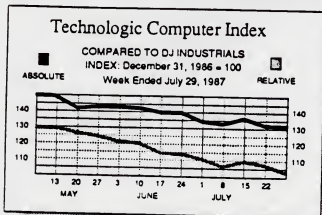
What propels the growth?

- Increasing data dependence, the delayed effect of the spreadsheet revolution of a few years ago. Those who are used to PCs want more quantitative information, and that data is beginning to outstrip personal computing's most common analysis tool, the spreadsheet.

- Greater data availability. Automatic sensors, scanners and character-recognition equipment have greatly increased the amount of information available for analysis in such formerly data-poor industries as financial services, retailing and consumer goods.

- New fields for quantitative analysis. Analytic techniques once applied only to the production and accounting sides of companies now are being used in sales, marketing and distribution as well. Databases are coming to the aid of revenue-generating parts of companies, as opposed to the

(Continued on Page Five)



RELATIONAL DATABASES

Continued from Page One

overhead and financial controls parts. Stock traders, for example, are being given tools that can make them aware of the consequences of a particular trade on a company's overall exposure to a given stock or industry.

- Connectivity also is encouraging the spread of databases. Networks and databases feed on each other; as the ability to share information increases with the installed base of networks, so does the demand for information.

- PC power. The latest personal computers — those based on Intel's 80386 and Motorola's 68020 — are able to do the kinds of work once restricted to minicomputers, which often involved large, time-shared databases. The new PCs have made such databases more affordable. Most personal-computer programs — dBase or R:base, for example — bear little relation to the kind of tools needed for fetching complex sets of information from a mainframe or minicomputer. But such data gathering is becoming increasingly practical with the emergence of IBM's Structured Query Language, SQL, as a standard that will work with both large remote and small local databases. In addition, workstations are becoming powerful enough to do sophisticated query-manipulation on their own.

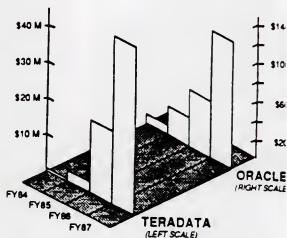
All this has been very beneficial to some of the emerging companies we follow. For example, in the mid-range, Oracle is pulling swiftly ahead by offering software that can be used over a wide range of different computers and operating systems.

Oracle has gone from being close in size to rival Relational Technology to essentially doubling its lead in market-share. On balance, Relational's Ingres product seems to outperform Oracle. But the technical edge (perhaps because it's slight) hasn't been able to overcome the comfort that information managers find in Oracle because of the great number of different computers and operating systems on which it runs. Ingres is doing well,

however, in the high-performance, VAX-oriented communities, such as engineering and academe.

Informix is strong in the VAX Unix market that market hasn't become as large as many believed it would. Most of the VAX installed

Database demand Rapidly rising revenues



NOTE: Fiscal years for both companies end in June
© 1987 by Technologic Partners, New York

runs Digital Equipment Corp.'s operating system VMS, and Oracle is a major player on such machines. In the minority of VAX installations that run Unix, Informix is dominant. One reason is that those machines have historically been too small to run Ingres or Oracle. For Informix, the danger is that small Unix systems will disappear into personal Unix systems.

At the PC level, Ashton-Tate is king, although IBM and Lotus Development Corp. are widely regarded as pretenders. As we've said before, we think the effect of the IBM/Lotus development is overblown as a threat to Ashton-Tate. Our best guess is that IBM in Texas is building its own

database portion of OS/2 Extended and that its agreements with Lotus — and others — cover applications that will run on top of the extended edition.

IBM's goal is to control the MIS sale. The strength of Lotus is to provide decision support. Those are complementary positions. There's no reason Ashton-Tate couldn't also develop a decision-support product that links to an IBM mainframe through SQL.

Ashton-Tate owns a million-and-a-half desktops through dBase and the tens of millions of work-a-day applications that have been created through the dBase language.

But the company is beginning to bump against the barriers of connectivity and database size. By contrast, the Oracle or Informix products have the ability to manage large amounts of data, particularly in networks or clusters of computer systems, but the installed base is far smaller. Today, Oracle, Informix and the two IBM relational products are really used by system builders who are programming turnkey applications for end-users.

In addition, these mid-range relational products are not oriented toward a single PC owning the entire database, nor toward ad hoc browsing, where users rummage around in the data. The mid-range relational packages are designed for databases shared by many people who use the information in well-defined ways.

By contrast, not only is Ashton-Tate's dBase not relational but it is primarily intended for the single-user systems.

The threat to dBase from the relational products lies less in their relational than in their multi-user nature. The danger is that the dBase installed base will keep using the product as-is, which is a static

market, or the market will move to networked systems based on Microsoft's OS/2. The OS/2 operating system and related hardware now gives personal computers the power of a time-shared VAX at a fraction of the cost. A MicroVAX costs about \$6,000 a seat; for that price, far more horsepower is available on a PC today.

At the high end of the market, Teradata is doing well with customers who seek more performance than IBM offers through its DB2 package. The company is in the process of trying to raise about \$34 million through Salomon Bros. and Montgomery Securities. (Montgomery is a major investor.)

It's been a difficult and expensive infancy for Teradata and its dedicated-machine approach to the data manipulation needs of the nation's largest corporations.

Total sales to date for the eight-year-old company are approximately equal to the equity capital that has been put into the company. But Teradata has been successfully playing on IBM's turf with its high-performance database machine and although sales are a couple of years behind original projections, they are tracking closely with new management's more realistic projections.

A total of 71 systems — ranging in price from \$200,000 to \$10 million — now have been shipped to 41 customers, which include such high-calibre references as American Airlines, Citibank (an investor) and AT&T.

Of particular interest is how smoothly the company is able to upgrade the customer to the new database computer it is developing around Intel's 386. The present machine, the DBC/1012, incorporates Intel's 286. But more important is the degree to which the company can convince potential customers that it's a survivor. ■

Technologic



Computer Letter is published by Technologic Partners, 419 Park Avenue South, Suite 500, New York, New York 10016. Telephone (212) 696-9330. Richard A. Shaffer, Editor and Publisher. Subscriptions \$495 per year in the United States and Canada. Overseas rates on request. The title Computer Letter is a trademark of Technologic Partners. Nothing that appears in Computer Letter may be reproduced in whole or in part without permission of Technologic Partners. Copyright 1987 by Technologic Partners. All rights reserved. The information and statistical data contained herein have been obtained from sources we believe to be reliable but are not warranted by us. We do not undertake to advise you as to any change in the data or our views. Technologic Partners and its affiliates and partners, or members of their families, may perform services for or engage in business with one or more of the companies referred to in the Letter, or with their competitors.

COMPANY UPDATE

SYBASE INC.

A young company in the on-line relational database market is getting good notices. . .

For such a little company, Sybase Inc. is getting a lot of attention. That's partly due to its focus on distributed databases. Most of the talk of distributed databases is mostly talk; customers will see little results for many years. But networking and databases do go well together and the initial work at Sybase makes it seem a promising contender.

Attention also stems from the persistent rumors linking it with Microsoft. (You can get reports that Microsoft is going to buy the company, or that Microsoft will resell the company's product as its database offering

under OS/2. Take your choice.) But mostly the attention is due to the performance of the company's product, a relational database for the on-line market.

The company actually has created a relational database that should be good for a variety of uses. But it's been careful not to position itself too early as a direct competitor to Oracle, the market leader among independent companies, which is sold primarily as a decision-support tool.

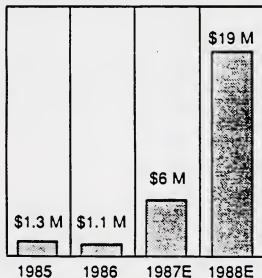
In part, the Sybase positioning reflects the realities of the database market. The airline reservations market is saturated. But there are possibilities in brokerage trading, banking services, and manufacturing and hospital automation, especially for software that makes it possible for complex queries to be answered promptly enough to act on the information.

In addition, that on-line positioning may give Sybase the time it needs to get large enough to pick a fight with Oracle.

Meantime, the company has made considerable progress since our brief peek at about this time last year. It is using Pyramid as a high-end Unix platform to take its data-handling capacity into the multi-gigabyte range. The mid-range is the VAX and the low end runs on the Sun Microsystems Sun 3 workstations. (The Pyramid product, still in development, would be used as a server, principally for larger databases; it is approximately equivalent to the Sun system in terms of its per-user response time when loaded with many users.)

Sybase already has front-ends to its database running under MS-DOS and its data

Great expectations Sybase revenue and forecast



SOURCE: COMPANY MANAGEMENT

How Is It Doing?

Selected operating results of Sybase

	YEAR 12/31/86	YEAR 12/31/88	YEAR 12/31/89
Revenue	—	\$1.3 M	\$1.1 M
R&D	\$5 K	\$1.0 M	\$2.2 M
Marketing and G&A	\$25 K	\$505 K	\$1.8 M
Net Income (Loss)	(\$30 K)	(\$196 K)	(\$2.8 M)
Retained Earnings (Loss)	(\$30 K)	(\$226 K)	(\$3.0 M)
Cumulative Investment	—	\$1.6 M	\$7.4 M
Shareholder Equity	(\$30 K)	\$1.3 M	\$4.3 M
Working Capital	(\$110 K)	\$1.1 M	\$3.8 M

© 1987 by Technologic Partners, New York

server almost runs under OS/2. The preliminary benchmark on the 386-based server is seven or eight transactions a second. The OS/2 version will be sold beginning about the end of the year.

Founded in November of 1984, Sybase started shipping the Sun Microsystems version of its relational database in October of 1986 and the VAX version this January. The shipments went to paying Beta sites.

Production release of the Sun product was in May and the VAX production release was

early last month. The company's development work with Pyramid is just going into Beta now and is expected to ship in September.

Initial orders have been so plentiful that Sybase has raised its revenue projections. For 1987, Sybase expects \$6 million in revenue a \$19 million in 1988. Break-even is projected the end of this year, or the first quarter of 1988.

At present, Sybase is hovering above the PC level — in system requirements and in marketing and distribution strategies.

Sybase is selling its products directly, creating a cost structure that is ineffective at user prices below \$30,000. For Sybase, the customer problem to be solved must be worth at least \$200,000, which is more expensive than the class of problems tackled by most PC database solutions.

From an applications viewpoint also, the Sybase PC products — at least initially — should have little effect on Ashton-Tate, Microrim or Ansa. Sybase is taking applications that might have run on the VAX or a larger machine and running them in a distributed environment on the PC. Eventually, however, there may be a switch to networked versions of Sybase from networks of dBase or Paradox.

The important aspect of the OS/2 and PS

Who Owns It?

Major investors in Sybase

	DOLLARS INVESTED	PERCENTAGE EQUITY
TRW	\$1.3 M	17.6%
Kleiner Perkins	\$1.3 M	17.6%
Hambrecht & Quist	\$1.4 M	19.5%
Charles River	\$1.8 M	24.8%
Oak Investment	\$1.3 M	17.0%

Sybase
2910 Seventh Street
Berkeley, CA 94710 • (415) 548-4500

Note: In the dollar amounts, M is millions and K is thousands. Amounts and percentages are Technologic estimates. Affiliates of investors are included under the name of the parent company. Kleiner Perkins is Kleiner, Perkins, Caufield & Byers.

© 1987 by Technologic Partners, New York

A Look at the Past

Selected data from private financings at Sybase

DATE	CLASS OF SECURITY	AMOUNT RAISED	VALUATION (POST-MONEY)	CUMULATIVE EQUITY INVESTMENT	RATIO OF VALUATION TO CUMULATIVE EQUITY
11/84	Common	N/M	—	N/M	—
3/85	A Preferred	\$1.5 M	—	\$1.5 M	—
5/86	B Preferred	\$3.2 M	\$9.0 M	\$4.8 M	1.9:1
12/86	C Preferred	\$2.5 M	\$16.4 M	\$7.3 M	2.3:1

NOTE: N/M = Not Meaningful. Dollar amounts are in millions. Valuations and the amounts of financings are Technologic estimates and assume full conversion of all preferred issues and exercise of all warrants. Columns may not add because of option exercise and stock buy-backs.

© 1987 by Technologic Partners, New York

family is that very flexible front-ends to data bases will become much easier to build, whether the data itself is on the local workstation or resident on a remote server or mainframe. The Sybase strategy is to say that the customer writes one application program that will run on a character terminal or a bit-mapped screen or under Microsoft's Presentation Manager or the Apple Toolbox with no additional effort on the part of the applications author. Write one applications program and its user presentation adapts to the machine it runs on. In some respects, Sybase is focusing on an area of strategic importance to IBM and Tandem.

Sybase, however, sees its competitive advantage as running much faster on much smaller platforms. Its main concern about IBM is less competition but that its products be able to communicate with IBM products. IBM owns MVS and Sybase needs to ensure that it can communicate with IBM on the mainframe. Many applications will be OS/2 application platforms with IBM 9370s as the server.

Until then, Sybase will keep working toward its modest goal: owning half of the market for relational databases on workstations and network servers. ■

By the Numbers: Teradata Corp.

Selected data from private financings

DATE	CLASS OF SECURITY	AMOUNT RAISED	VALUATION (POST-MONEY)	CUMULATIVE EQUITY INVESTMENT	RATIO OF VALUATION TO CUMULATIVE EQUITY
12/79	Common	\$25 K	N/M	\$25 K	N/M
7/80	Series 1 Preferred	\$2.6 M	\$3.9 M	\$2.7 M	1.4:1
10/81	Series 2 Preferred	\$12.0 M	\$25.3 M	\$14.8 M	1.7:1
2/83	Series 3 Preferred	\$12.0 M	\$54.2 M	\$26.8 M	2.0:1
6/84	Series 4 Preferred	\$15.0 M	\$90.9 M	\$41.8 M	2.2:1
9/85	Series 5 Preferred	\$10.2 M	\$49.2 M	\$52.0 M	1.0:1
9/85	Series 6 Preferred	\$4 K	\$86.3 M	\$52.0 M	1.7:1
7/86	Series 7 Preferred	\$15.0 M	\$84.0 M	\$67.2 M	1.3:1
8/87	IPO	\$34.2 M	\$243.3 M	\$101.4 M	2.4:1

MILESTONES:

Company founded:	7/79	Investment to first commercial shipment:	\$41.8 M
First commercial shipments:	10/84	Investment to break-even:	\$52.2 M
Break-even, fiscal year ending June 30	4Q86	Cumulative sales to IPO:	\$67.1 M

NOTE: Assumes price of \$19 a share on initial public offering. Valuations are Technologic estimates and assume full conversion of all preferred issues. In the Series 6 financing, the Series 4 preferred was converted into the Series 6 and only \$4,000 in additional capital was raised.

INTERVIEW

RELATIONAL COMES ON-LINE

Robert Epstein, 34, is executive vice-president and cofounder of Sybase, Inc., as well as chief architect of the Sybase System. Previously, he was vice-president of development at Britton Lee, Inc. and principal architect of its data base machines. In the late 1970s, he served as project manager for the Ingres project at the University of California at Berkeley. Epstein recently spoke with Richard Skirude about the direction he expects the market for relational data base management systems to take.

Sybase claims to provide the first relational DBMS for on-line applications. What is the market response?

People are moving toward more aggressive, more interactive applications. And often, they are finding they must move toward newer technologies to support those applications.

We're finding essentially two types of customers. The first type is the existing relational DBMS user. These people are now looking at building applications with stringent performance, integrity and availability requirements not provided by current relational DBMS products.

We also see new users who have never used a relational product before because all their applications require a level of function, speed and support that were previously not provided by relational DBMSs.

Hierarchical and network data base systems provide the performance, availability and reliability required for on-line transaction processing. So why use relational DBMS?

This gets back down to the inherent benefits of relational systems — productivity, flexibility and maintainability, as well as built-on decision support capabilities.

Your data base is a mirror of your business. And, as things change in the external world as well as in corporate policies, your data base and applications must reflect those changes.

Relational DBMSs allow you to make those changes much more easily than with hierarchical or network systems. Also, when users need to run ad hoc queries on data, they don't need to transfer it to a relational system; they can actually have the

decision support component built right in.

What does it take for a relational DBMS to support on-line applications?

The three primary distinguishing features between on-line and decision support ad hoc applications are performance, availability and data integrity. There is no inherent reason why a relational DBMS cannot provide these capabilities. But the emphasis on relational systems up to this point has been on productivity and ease of use.

The founding of Sybase was oriented toward the vision that the market would evolve and start to demand that SQL be the only data base framework. Well, this couldn't happen if the product didn't have the ability to provide on-line support. And to achieve that, you have to build a new architecture from the ground up.

That architecture had to incorporate some of the things that worked with the hierarchical and network products, which are known for their high-volume performance and operational features.

What relational DBMS software architecture is required to support on-line applications?

What we've got is a requester-server architecture. Requester-server architecture is a term that is beginning to be used quite a bit, so let me explain the three fundamental concepts behind it.

The first is the clear separation between the front-end application and tools and the data base engine. The second component is that the data base engine itself, rather than the operating system, has to manage multiple users and multiple processes. We call this multithreaded server architecture. Finally, the third

fundamental component of requester-server architecture is the notion of moving transaction-integrity logic, or programming intelligence, into the data base itself.

Some of this we've taken from the mainframe world.

Multithreaded server architecture is a good example. This concept comes from the fact that, in the mainframe world, the data base, not the operating system, handles multiple users concurrently. Moving the data integrity from the application into the data base was done with the notion of adding procedural logic in the data base, and products like IMS and IDMS provide capabilities like this.

Is Sybase going to support users trying to migrate out of hierarchical and network data bases?

The first goal for aiding conversion is coexistence. Applications are not static; they grow and change. Our goal is to use Sybase's distributed technology and open architecture to allow people to complement existing applications with new functions in Sybase. Sybase then acts as an application driver in existing application environments to insert and retrieve data.

To provide coexistence, you have to provide gateways to machine environments where you can send transactions to those machines and have them translate it into IMS, IDMS or whatever application environment they are currently running under. And then it must be possible to pull that data and extract it back into a Sybase environment as part of a full transaction or report.

What about distributed data bases?

There are a lot of issues with distributed. Right now, it's a technology in its infancy. And there are a few vendors who are attempting to provide a distributed solution — Sybase is one of those companies. Ultimately, it is our belief vendors will have to work together to provide a solution that is totally distributed.

Today, we are providing

distributed distributed update capabilities, complete with a two-phase commit protocol. We've implemented this first because in on-line applications, update capabilities are much more crucial than retrieval.

The requester-server architecture is especially important in distributed architecture. The ability to store data integrity in the data base allows for multiseite integrity. This is key in establishing distributed data bases across multiple sites.



Robert Epstein

ALAN WITKOWSKI

Imagine the reaction of a person responsible for a data base in one city to the possibility that someone else, in a city he has never heard of, will be able to update his data base. There is no way that first person will allow that to happen unless he can control the kinds of updates that will be made.

What environments are you planning to support?

We've identified several strategic hardware environments we intend to support. Our strategy is to remain focused on those hardware environments. Because we are so oriented to performance, we can't afford to trade off performance in order to support a wide range of systems.

Currently, our system runs on VAX/VMS and Sun Unix, and we support the networks that are used to tie these hardware systems together. Our focus is on VAX, on the IBM mainframe, on a few key Unix systems and, of course, the personal computer. •

Developers can't afford dependence on magic

BY STEVEN CANIANO

There's a scene being played out with increasing frequency between application developers and data base managers. It is a confrontation one about false expectations that has its roots in the mythology surrounding relational data base management systems. The dialogue usually goes something like this:

Application developer: "I'm having problems with my system."

Data base manager: "What sort of problems?"

Application developer: "Response time is just terrible. I think it's the DBMS."

Data base manager: "Why is that?"
Application developer: "Well, it just isn't a good product, and besides, everyone I've ever spoken to says it's a real dog. I think we should convert to another product. I know of a better one."

Data base manager: "Well, before you do that, how about if we get together to discuss your logical and physical data base design?"

Application developer: "My what? This is a relational system!"

In simpler times, when there were only two kinds of data bases — hierarchical and network — scenes like this were unknown.

The freedom of relational DBMS

In the modern world, there is another technology available to the application developer known as the mystical and magical relational DBMS. As everyone now knows, this wonderful invention frees the application developer from the necessity of undertaking the laborious and highly iterative (and, in most cases, uninteresting) tasks of planning and verification. It is now possible to build applications without

Caniano is a member of the technical staff at AT&T in Parsippany, N.J. He is responsible for the evaluation and recommendations of DBMS products for the Unix operating system within AT&T.

even considering what used to take many months of effort. The relational systems allow us to define an application, throw the data base up and enter the "select where" world of data access routines.

Best of all, because so little time is required to build a system and because there are so many other products available on the market, if we get stuck with a kernel it would be a relatively small effort to rewrite the entire application using a new product.

How is it that the relational systems have become immune to the plagues that tormented their forefathers? Well, the truth is that they haven't, and anyone who believes otherwise will more than likely exhaust their fiscal year's software budget faster than you can say "fourth-generation language."

A relational DBMS is really not magic, regardless of what it's been told. It is merely a sophisticated piece of software, and it is only as smart as you allow it to be. All the issues that existed with hierarchical and network DBMSs are still present in the relational world.

The beauty of a relational data base is that the programmer can be oblivious to the fact that the storage structure of a table has changed. However, this does not mean it is no longer necessary to be aware of storage structures. On the contrary, a data base should be built by a data base designer who has learned the requirements for an application and has carefully made choices by weighing access strategies against key selections, indexing techniques, secondary key selections and file parameters.

If access are not carefully planned and users are given the freedom to access the data base in any imaginable manner, performance will go flying out the window. This would also be true of a hierarchical or network system. The difference is that while in the latter case people would think twice about traversing many

segments and links of a data base because of the enormous complexity involved, the relational model encourages ambitious queries.

So why are so many people blind to the fact that relational data base design is a skill just as network data base design is? Why is it that people who work so hard to write efficient application code allow a piece of software to control the heart of their system? Why is it that when people hear the word "relational," they suddenly believe in magic?

One reason is the undeniable simplicity of the relational model. This is an excellent feature when you want to prototype an application or build a simplistic data base. It is this idea of simplicity, however, that causes many of the relational products to earn bad reputations.

Part of the fault also lies with the vendors of the relational products. In an effort to sell as many systems as possible, they have, at times, done their products an injustice.

Many systems have been sold to unsuspecting end users with no reference to the importance of data base fundamentals. Customers have been led to believe it is the product that performs and that the manner in which you use the product is irrelevant.

Between this misinformation and the fact that the systems are so easy to use that "anyone can do it," it is not surprising that the result has been poor data base designs. The vendors have, in effect, made data base designers of us all, and there are now many people building relational data bases who have never even heard of data normalization.

Even more sophisticated users fall prey to sales pitches that concentrate on the bells and whistles and promises of maximum performance, but leave out details such as what you have to do to achieve the promised efficiency.

The worst part is that there is no screw you can turn, no query you can optimize more efficiently, no turbo engine you can add to the DBMS that will cure a basic case of poor data base design.

A user's first impulse is to point the finger of blame at the DBMS. After all, it was supposed to deliver the best performance without any effort and it's not performing. The logical conclusion to this, of course, is to go out and buy a better product. And it cycle continues.

So who profits? Certainly not the user. After buying at least two relational DBMS products (which are far from expensive) and rewriting an application, probably using the same flawed data base design techniques each time, the user is stuck with a huge software bill, a system that still doesn't perform well and the prospect of having to call in a highly paid consultant to analyze his application and redesign the data base.

What about the vendors? Do they benefit? Possibly, but only in the short term, because eventually the market they are encouraging will rebound and blacken the reputations of what may, in fact, be very good products.

What can be done

So what is the answer? Unfortunately, there is no one answer unless we choose to turn our backs on the very real advantages that relational DBMSs offer.

The vendors could help the situation greatly by putting more emphasis on the workings of the relational model and on solid design and maintenance techniques. They should stress that good performance isn't automatic, but depends on what a user does with a product.

Much of the application rewriting and data base conversion going on today could also be avoided if developers would look more closely at the relational DBMSs they have been looking for solutions in still another purchase. Chances are, a competent development group could write a successful application using any of the popular packages available today.

The real solution does not lie in DBMS selection but in data base design. Just because relational DBMSs are geared with great flexibility and adaptability does not mean that we can afford to lose touch with the art of data base design. *

DB2 SUPPORT IS COMING!

DSIMS Data Dictionary

Soon our customers will have the same control, cross-referencing, reporting, and data statement generation capabilities for DB2 information that they've enjoyed for years with their IMS Systems. Call us today to learn more about the DSIMS Data Dictionary. DSIMS provides solutions for data and database administration.

DSIMS Corporation
2730 Siemens Freeway • Suite 401 W. 61
Dallas, Texas 75207
214-636-7817

SQL/DS...

THE EASY WAY

Now SQL/DS database management can be easier and more powerful with VMSQL/EDIT—the new multi-function table editor from VM Software, Inc.

With VMSQL/EDIT's full screen display, even non-experienced SQL users can easily update data stored in SQL/DS tables. VMSQL/EDIT gives you a more powerful way to work with tables including the ability to update, insert, delete, and re-

view on both single and multiple rows of tables. It also includes a powerful macro facility that dramatically reduces the time needed to build ad hoc data entry applications.

To find out exactly how easy SQL/DS databases really can be with the right help, call today. We'll send you a free copy of the new SQL/DS Quick Reference Handbook just for calling.

Applied Relational Technology

A Division of VM Software, Inc.
To receive a free SQL/DS Quick Reference Handbook that gives you a complete listing of software creation names, SQL commands built in functions, and on-line key definitions and expressions, please call today.

800-562-7100 OR 703-264-8000

1800 Alexander Bell Drive

Reston, VA 22091

VM

SOFTWARE, INC.

Circle 47 on Reader Service Card

Local-Area Networks.....	77.88.....	-8.38.....	-9.7%.....	+ 15.8%
Peripherals.....	204.77.....	-11.01.....	-5.1%.....	+ 30.4%
Semiconductors.....	296.14.....	-18.63.....	-5.9%.....	+ 59.7%

dropping 9.7 percent for the week
lowed, falling 5.9 percent. Wyse Te
the most strength amid a weak field

• COMPONENT STOCKS: *By Group* •

Software (Large Systems)

Company	Thursday Close	Change Week	% Change Since 12/31/86	Sales: Last 4 Qtrs. (Mil.)	EPS	Cap./ Sales	P/E
CA	23.88	-0.75	+ 74%	348.4	0.77	3.4	31
Duquesne	17.25	-1.25	+ 9%	34.8	0.71	5.4	24
MSA	11.88	-1.25	-7%	223.0	0.37	0.9	32
Morino (s)	16.38	-0.12	+ 31%	31.2	0.59	5.4	28
Panosophic	18.5	-2.25	+ 43%	114.6	0.95	2.9	19
Uccel	39.75	-0.50	+ 61%	150.3	1.20	4.5	33
VM	17.75	-1.13	-11%	28.9	0.79	4.0	22

Software (Small Systems)

Company	Thursday Close	Change Week	% Change Since 12/31/86	Sales: Last 4 Qtrs. (Mil.)	EPS	Cap./ Sales	P/E
Aahton	23.63	-1.87	+ 6%	229.7	1.38	2.6	17
Autodesk	21.25	-1.75	+ 86%	58.6	0.83	8.4	34
Informix	19.50	+ 0.50	+ 100%	28.5	0.47	5.8	41
Lotus	30.13	-0.37	+ 75%	326.2	1.23	4.2	24
Microsoft	97.75	-4.25	+ 103%	345.9	2.59	7.8	38
Oracle	20.50	-3.00	+ 59%	131.8	0.50	5.0	41
Soft Pub	8.25	-0.25	+ 18%	34.3	0.55	1.8	15

Local-Area Networks

Company	Thursday Close	Change Week	% Change Since 12/31/86	Sales: Last 4 Qtrs. (Mil.)	EPS	Cap./ Sales	P/E
Bridge	21.63	-2.00	+ 43%	59.2	0.75	3.2	29
Net Sys	10.25	0.00	-26%	109.6	0.59	2.7	17
Novell	19.00	-1.50	+ 48%	135.4	0.62	3.7	31
3Com	16.00	-1.88	-1%	110.3	0.76	2.3	21
Ungermann	11.00	-3.00	+ 19%	129.4	0.32	1.5	34

Desktop Systems

Company	Thursday Close	Change Week	% Change Since 12/31/86	Sales: Last 4 Qtrs. (Mil.)	EPS	Cap./ Sales	P/E
Apollo	18.38	-1.25	+ 14%	476.9	0.61	1.4	30
Apple (s)	41.75	-2.25	+ 106%	2385.4	1.35	2.3	31
Altos	12.50	+ 0.12	+ 11%	142.2	0.56	1.2	22
Convergent	7.63	+ 0.13	+ 27%	320.4	-0.89	1.1	N/A
Compaq	45.75	-0.50	+ 138%	692.2	1.64	2.4	28
SiliconG	17.75	-0.75	+ 37%	86.3	0.64	2.8	22
Sun	34.63	-3.50	+ 44%	425.5	1.03	2.9	34

Large System

Company	Thursday Close	Change Week	% Change Since 12/31/86	Sales Qtr
Alliant	19.50	-0.75	-3%	
Amdahl	36.00	-3.50	+ 54%	
Convex	14.75	-0.88	+ 53%	
DEC	160.88	-5.37	+ 54%	
DG	30.63	-1.37	+ 3%	
HP	59.25	-3.75	+ 41%	
IBM	160.13	-8.00	+ 33%	
Prime	25.63	-2.87	+ 57%	
Stratus	26.25	-5.75	+ 24%	
Tandem (s)	28.13	-2.25	+ 64%	
Unisys	126.75	-3.50	+ 58%	
Wang	18.13	-1.00	+ 39%	

Semiconduct

Company	Thursday Close	Change Week	% Change Since 12/31/86	Sales: Qtr
Intel	45.75	-3.50	+ 118%	
Motorola	55.50	-2.50	+ 56%	
National	13.00	-1.38	+ 22%	
TI (s)	60.63	-3.75	+ 54%	

Peripherals

Company	Thursday Close	Change Week	% Change Since 12/31/86	Sales: Qtr
Adeptec	11.75	+ 1.00	+ 6%	
CDC	27.63	-1.12	+ 5%	
Detaprod	11.13	+ 0.25	-3%	
Emulex	7.63	-0.25	-8%	
Maxtor	15.00	-2.38	-14%	
Micropolis	34.25	-4.25	+ 83%	
MiniScribe	12.75	-1.63	+ 46%	
Seagate	27.00	-3.88	+ 41%	
W. Digital	27.25	-0.75	+ 47%	
Wyse	30.38	+ 2.00	+ 7%	

EXPLANATION: All the stock groups—including the CSM Index of 52 stocks—appear in the "Component Stocks" section.

"Sales: Last 4 Qtrs." sums the last four quarters of a company's sales. "EPS" looks at shares. "Cap./Sales" divides the total stock market value of a corporation by its sales-to-technology investors. "P/E" (price-earnings ratio) divides the market price of the stock generated in its most recent four quarters. The EPS figures are derived from net income such as gains on sales of assets or tax loss carryforwards. Also, where applicable, the instruments.

Stock splits (designated by an "s") are taken into account by the use of multiplier receives a multiplier of 2 when summed in one of the groups. All stocks began June

INSIDE

Interview

Robert Epstein, executive vice-president and co-founder of Sybase, Inc., talks about the relational DBMS marketplace and where it's going. Page 57.

The Magical Sell

The relational approach doesn't eliminate the necessity for good data base design: Vendors that promise magical results do everyone a disservice. Page 59.

Product Face-Off

IDMS/R and DB2 offer users distinctly different choices for managing data bases. Page 512.

Seeing the Forest and the Trees

A DBMS has given the Park Service control over its far-flung resources. Page 54.

Blind Spot

Visual interfaces do not yet lend themselves to easy browsing. Page 515.

Vendor Viewpoints

Data dictionaries have a crucial role to play in DBMS. Page 516.

A move to DB2 may require changing your approach to data access, but the net performance improvement will justify the effort. Page 517.

Product Chart

A detailed guide to mini-computer and mainframe DBMS. Page 518.

SENIOR EDITOR
Joanne Kelleher

ASSOCIATE EDITOR
Penny Janzen

RESEARCHER
Sally Cusack

DESIGN EDITOR
Mylene Magowan

ASSISTANT RESEARCHER
Bonnie Mackel

Cover illustration:
Franklin Hammond

Copyright © 1987 by CW Communications, Inc. All rights reserved. Reproduction of this article is prohibited without the written permission of the publisher. This article is published under the terms of the Copyright Clearance Center, Inc. Copyright Clearance Center, 27 Congress St., Salem, MA 01970-9171.

In a climate of open exchange and peaceful collaboration, applications would move freely among competing systems.

THE IMPERATIVE OF COEXISTENCE

BY RICHARD SKRINDE



Peaceful coexistence is a subject very much on the minds of many data base-dependent organizations. Their concerns do not have anything to do with armament policies, trade negotiations or relations between the superpowers. It is system compatibility, not diplomacy, that is preoccupying users of medium- and large-scale data base management systems technology.

The task these users are faced with is one of reconciling the present with the future. A new generation of relational DBMSs has emerged,

which promises many benefits—but only if it can be successfully linked with existing application architecture. Technology coexistence is the term being applied to the goal of merging new technology into traditional system structures and, like global issues of collaboration, the desired end is a lot clearer than the necessary means.

Security Pacific National Bank is an example of an organization stationed at the forefront of DBMS technology and trying to deal with the issues of technology coexistence. Security Pacific has been a traditional IBM IMS hierarchical data base shop and has developed many ambitious IMS-based applications.

Its Host Authorization System, for example, supports a large network of automated teller machines and bank card readers that are used to check payment authorizations. It was developed utilizing IBM's IMS Fastpath and took advantage of every availability and performance feature of this development system. Response time is 0.1 seconds, with hit rates on the system of 15 transactions per second. Bank ATMs have an uptime in excess of 99%, including the time the operator shuts down the ATM for daily service.

Another Fastpath application, a bulk filing system called Total On-us Processing and Services (TOPAS), keeps every transaction for every cus-

Skrinde is a data base management consultant based in Alameda, Calif. He specializes in fourth-generation language-based business applications and practices.

tomers checking and savings account on-line for 65 days. Using advanced facilities such as the multiple-area concept, TOPAS processes four million transactions in less than one hour every night.

In 1985, however, the bank set aside IMS products and switched to relational technology with IBM's DB2. This was a major shift for an organization committed to, and successful with, DBMS applications.

Ka-yu Yu, manager of data base services at Security Pacific, says that as far as the bank is concerned, relational technology is the progressive path. "DB2 or dedicated relational machines like Tandem Computers, Inc.'s Nonstop SQL are the future for us. We have completed nine applications in DB2 and have had such good results that we plan to look at DB2 for every new application. Right now, we are stress-testing the product to see how far you can push it before it quits," he says.

Making the worlds meet

For the moment, Security Pacific is maintaining a strict separation between the two DBMS environments. No relational applications currently have to access any of the data in the older IMS applications. Integration, however, is inevitable. "We know that it will only be a matter of time," Yu says, "before we must develop an application that will have to access both data bases. It is a difficult problem, and we are studying the best way

Coexistence

FROM PREVIOUS PAGE

to handle it."

The effort involved in adopting the new technology is substantial, according to Yu, but the advantages are even more significant.

"Applications can be developed much faster," he says. "The cost of maintenance and enhancements is much lower. And, most important, relational technology will support distributed data bases. Transaction processing can be accomplished at many sites, rather than having to ship all of the data to one central site and then attack it with a giant mainframe and IMSFastpath."

The distributed data base is the ideal response to the expansion that has resulted from the deregulation of the banking

lated by the IMS application to provide American Airlines management with same-day information about the total number of people flying in and out of that airport, as well as all other airports, via a trend line and other reporting formats.

The second stage is to incorporate an aggressive development program that will connect a large relational data base system to the on-line system. That linkage will allow a manager to access the IMS with a relational query, such as, "How many people flew from New York to Boston between noon and 6 p.m. today?" The manager would not need to understand much about computers and could get the information immediately by using a format that could be transferred directly into his word processing or

spreadsheet package.

American Airline's goal is to put the tools for managing the critical information contained in the on-line system directly in the hands of managers rather than have them make requests for reports through the DP department.

Joyce Wren, assistant vice-president for American Airline's Data and Application Services, says, "We must do everything possible to help our clients become more productive. Our current project to create a decision-enabling store that will allow users to manipulate data directly is an example of that commitment. We selected a relational approach in order to gain rapid development capabilities and to decrease maintenance and enhancement costs as well."

The project will take several years to fully implement, according to Wren. "It is important to move slowly when converting to relational technology," she says, and operations people all have to adjust and accept it culturally."

Removing IMS's blinders

Moving to new technology also involves the major effort of selecting a vendor, as is evidenced by the city of Boston's 1 1/2-year search for an alternative to IMS. Since the city's computer operation was a Cobol VCM shop with a couple of applications created in IMS, initial consideration was given to Cobol productivity tools — screen painters, report writers and code generators. Rather than buy all of these

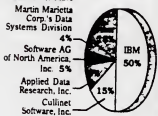
products from one vendor, the city of Boston opted for a mix of products from several vendors.

MIS people, says with a lot of CA-Univac experience. Mike Heron, MIS depa takes a lot of call by for the b

The pre-Heron as many cloom many good

Large-scale DBMS software

1986 market share



INFORMATION PROVIDED BY INTERNATIONAL RESOURCE DEVELOPMENT INC. FOR ENR CHART

industry, Yu explains. "A new node could be set up in the system for a new site without having to do major rework on the applications," he claims.

Expanding the skies

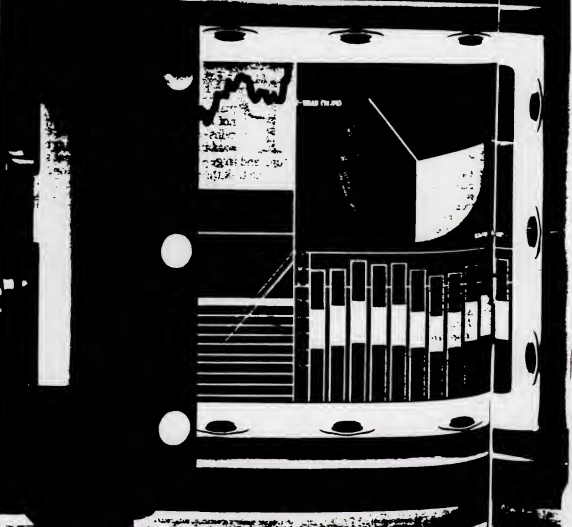
Security Pacific is not alone in its migration of data base architecture. American Airlines maintains one of the largest computer networks in the world. The firm's real-time reservation system supports approximately 100,000 terminals and processes an average of 1,500 transactions/sec., with a three-second response time.

A second real-time system supports flight operations. That system is connected to 20,000 terminals and interfaced to a computer on every American Airlines aircraft to monitor when each plane leaves the gates, takes off or lands. These real-time systems run on IBM 9091 Model 400 mainframes and are tightly coded in Transaction Processing Facility Version 2 (TPF2), an outcropping of Airline Control Program. A third system is a large on-line system called the commercial complex, which supports all corporate business and management activities with applications built using IMS.

American Airlines has a two-stage plan for technology coexistence. For the first stage, the company has developed hardware and software linkages between its on-line and real-time systems.

These linkages have greatly enhanced the airline's ability to manage the information stored in six two massive real-time systems. For example, an agent enters all of the tickets collected for a particular flight into the real-time system. An IMS-based application in the commercial complex extracts this information from the real-time application that has been written in TPF2. This information is then con-

AT&T Power Protection Systems. Your best security against costly downtime.



products from different vendors, however, city officials decided that obtaining a relational data base and getting all of the productivity tools from one vendor made the most sense.

MIS personnel evaluated a lot of vendors, saw a lot of slide shows and talked with a lot of salesmen before selecting CA-Universe from Computer Associates International, Inc. It was, according to Mike Hernon, chief analyst in Boston's MIS department, a turning process. "It takes a lot of energy," he says, "to drastically change your life, even if it is hopefully for the better."

The process was particularly difficult, Hernon adds, because there were so many close contenders. "There are so many good products out there," he says,

"that the MIS shops that are married to IBM and that will only move from IMS to DB2 without ever doing that type of evaluation are really missing something."

The road behind us

Technology coexistence is a complex realm encompassing a wide range of activities, including the creation of new strategies, interface gateways, conversion algorithms and administration philosophies, all of which are aimed at incorporating new relational systems with existing DBMS applications. It is a major issue that vendors, driven by user requirements, are trying to solve, often on a case-by-case basis.

To fully understand all that is involved in achieving technology coexistence, it is

necessary to look at the forces behind the evolution of DBMS. Punch cards and magnetic and paper tapes were the sequential devices used to store data in early computers, making information management a sequential process. Update transactions had to be sorted and grouped into batches that could be processed in one sequential pass of the data.

Random-access storage devices advanced the state of information management. One record could contain pointers to any other record, and the storage device could access the records in that order. However, each read or write operation had to be programmed uniquely and at a very low level. A hodgepodge of approaches was implemented.

Access methods such as IBM's VSAM

were developed to handle I/O in a general-purpose manner that relieved one level of complication but created another. Low-level I/O constructs no longer had I/O recoded in each application, but the application architecture was so undisciplined that systems would store each piece of data in several formats, and many times, each new application would result in a new copy of the data. Much development effort was still required to improve data storage and retrieval techniques.

IBM, working jointly with major aerospace firms, developed a pilot DBMS effort to oversee the tracking of the many components required for the Apollo space program during the mid-1960s. This pilot program was the original development work that created the hierarchical data model-based IMS product line.

The hierarchical model allows one parent to support multiple children on any node. This tree-like structure forced designers to model applications very care-

Eliminate the cause of up to 50% of your computer downtime: power disturbances.

Power disturbances, brief and imperceptible, cause very visible data loss, data errors, and equipment damage, all resulting in costly downtime.

According to AT&T Bell Laboratories and IBM research, a typical computer site experiences as many as 135 commercial power disturbances a year, accounting for up to 50% of all computer downtime.

The protection solution AT&T offers two product lines to combat these disturbances: the Uninterruptible Power System (UPS) and the Power Line Conditioner (PLC). Each effectively eliminates power fluctuations, including noise, transients, peaks, brownouts, and distortions.

The difference being that the UPS includes a built-in battery reserve for protection against blackouts. The UPS is available in 1, 3, 5 and 10 KVA power ranges. The PLC is available in 3, 5 and 10 KVA models.

A 50-year advantage. Why specify AT&T's power protection equipment over that of other manufacturers? Because AT&T has an unmatched 50 years of

experience in manufacturing power equipment. And, because AT&T also designs and manufactures computers, we have a unique understanding of what should go into a superior power protection product.

For instance, our parallel processing architecture offers reliability few others can provide. It also maximizes cost-efficiency: less power is needed to run our systems, and heat loss is substantially reduced.

Easy does it.

AT&T UPS and PLC power protection systems are easy to install, need no operator, and require no scheduled maintenance.

Furthermore, AT&T backs you with an unequalled nationwide service network and a 24-hour toll-free number for technical service support.

Fast delivery.

AT&T is ready to ship from stock. Once our Dallas facility has your order in-hand, we'll have your system speeding on its way to your site.

So for maximum security against power disturbances, along with low-cost, trouble-free performance, call AT&T at 1 800 372-2447* or mail the coupon below. Let us show you how to turn expensive downtime into productive uptime.



AT&T's LPs available in U.S. and 10 KVA models

HERE are so many good products out there that the MIS shops that are married to IBM and that will only move from IMS to DB2 without ever doing this type of evaluation are really missing something."

MIKE HERNON
THE CITY OF BOSTON

fully, because any design change put application development back to square one.

The Coday's Committee was responsible for the first DBMS standard. A data base task group was formed that, by 1971, had convinced the committee to endorse an improved version of the hierarchical model. The new network data model allowed designers to define relationships between any of the nodes without having to navigate back up the tree and down another branch.

An early development project based on the network model was undertaken at B. F. Goodrich Co. It was called IDMS and was ultimately purchased by Cullinet Software, Inc.

Breaking tradition

Traditional DBMS technology had a downside, however. MIS departments were strapped with the complex and enhancing hierarchical or network-based DBMS applications as corporate needs grew. Programmers likened this effort to having to move hinders.

Enhancement products such as IMS Fastpath were introduced to increase transaction processing capacities for the banking industry. Performance did, indeed, improve, but the already-stressed programmers almost buckled under the even heavier maintenance load.

Existing DBMS technology also repelled many users, who regarded it as hostile and unusable, feeling that their applications could not be expressed by a model that looked like a tree (the hierarchical model) or a spiderweb (the network model).

IBM again went to work, this time on creating a relational system at its San

AT&T Power Protection Systems
Dept. 2030 LEADS, 5555 Main Blvd., Allen, TX 75015
Please send me more information on your PLC.

Name _____
Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Phone _____

Circle 10 on Reader Service Card



AT&T
The right choice.

development that emerged. System R, would later become DB2 and SQL DS.

A start-up company, Oracle Corp., influenced by that development, introduced a product that maintained compatibility with DB2 and differentiated itself with a superset of the SQL user interface. Before long, another relational development project at the University of California at Berkeley resulted in two commercial products. Ingres from Relational Technology, Inc. and CA-Univers from Computer Associates. Following that, the infant Unix marketplace contributed Informix from Informix Software, Inc. and Unify from Unify Corp. Between 1980 and 1982, relational products were released in a steady stream.

Relational-based DBMS products initially promised much but often delivered little. Products ran slow, and file systems crashed. Users gritted their teeth and hung on. By 1985, only five years after their introduction, relational products rapidly matured, becoming quite dependable for decision-support applications. However, traditional DBMS architectures with nearly three times the market maturity still provided better performance and entrenched integrity features and retained most of the lucrative on-line transaction processing sector of the marketplace.

Straddling old and new

The latest versions of relational products have now matured to the point at which they are more powerful than traditional data base products in every aspect.

Even products that have well-established hierarchical or network products seem to take it for granted at this point that their customer base for those products will want to integrate relational capabilities, if not convert totally to a relational DBMS.

IBM, cognizant of the fact that large investment in traditional technology cannot simply be cast by the wayside, is offering its IMS customers assistance in bridging traditional technology with relational innovation by means of synchronization and automation of critical systems-administration functions. "We are not going to abandon our IMS users," says Donna VanDusen, senior DBMS product manager for both IMS and DB2. "Our IMS user base influences our development efforts. They know exactly what they need in terms of enhancements, and we work very closely with them."

Concom Systems, Inc. is also trying to satisfy existing users, who are wedded to the traditional approach, while moving itself decisively into the relational fray. Although active marketing for Total Concom's hierarchical product, has been discontinued, the company is still supporting its users, according to Tom McLean, vice-president of marketing and product planning.

"We no longer actively market Total, and I'm sure that IBM's IMS user base has stopped growing as well," he says. "We continue to service the requirements of our Total users, but our emphases and resources are pushing Supra, our relational data base product."

One notable exception to the "relational-better" trend is a product from Officemaths' (tread is a product from Officemaths) in Ottawa. It is a unique DBMS implementation designed to automate office information. Officemaths' DBMS incorporates text processing within a hierarchical model. Documents are structured so that each separate heading

Installed base for medium- to large-scale DBMS software

Projected growth by equipment category, 1987 to 1991

	1987	1988	1989	1990	1991
Minis	824,100	1,068,000	1,343,400	1,634,400	1,937,500
Superminis	89,100	124,600	170,100	227,000	297,200
Mainframes	163,600	202,300	247,800	299,200	355,400
Minisupers/supers	4,620	6,140	7,920	9,840	11,740

INFORMATION PROVIDED BY INTERNATIONAL RESOURCE DEVELOPMENT, INC. (C) 1987

and paragraph is defined as a text field of unlimited length.

"Relational models are not best for everything," says Officemaths' President Glenn McInnes. "The hierarchical model is the most efficient way to build a data

base for documents. This is because documents are inherently hierarchical in nature."

The standards trend

Open architecture designs allow connection of different manufacturers' systems to build computer networks. Standard network protocols, standard communications protocols, the Posix operating system standards and the X-Open standards all support distributed environments.

Users benefit because their applications can be moved from one environment to another with little reprogramming. Chrysler Corp., for example, has utilized computing based on open architecture standards to help build a competitive edge, and DBMS plays a crucial role

in that the manufacturer implements port load scheduling of system D, system T develops enough use-by-it to analyze Jo B integrates Chrysler our next application. "Ingr



If You're Considering DB2, You

If you're looking for the full power of relational technology, there's just one place to find it. SLPRAs* from Concom! Because no other DBMS gives you the advanced relational capabilities to reach such high levels of performance and productivity.

Not even DB2 from IBM!

More and more companies with an eye for success are capitalizing on all-new advanced relational SLPRAs—companies like Hewlett, Heinz USA, Best Western and over 150 others. And it's easy to see why. Each day, they realize the rewards of the innovative three-schema architecture that enables SLPRAs to soar above and beyond DB2.

SLPRAs advantages are clearly visible. Unmatched performance. Advanced relational implementation. Referential integrity. Integrated SQL capabilities. Enhanced Redundancy management. Automated data design tools. Dictionary facilities. MVS, DB2 and VM versions. And more. Much more.

It's no wonder called SLPRAs the DBMS on the mar

Find out how S new heights of performance or call us you'll soon discover that DBMS can't

in that effort.

The Detroit-based Outer Drive Manufacturing Technical Center (ODMTC) has implemented a relational DBMS to support loading, cost estimation, equipment scheduling and tracking and the establishment of manpower standards. The relational DBMS selection team looked for a system that would allow applications to be developed quickly and easily, be flexible enough to allow development on a module-by-module basis and allow end users to analyze their data.

Joe Blust is the manager of computer-integrated manufacturing (CIM) at the Chrysler ODMTC. "We want to spend our energy building cars, not data base applications," he says.

—Ingres from Relational Technology

gives us an open-architecture solution that provides us with three key features: distributed access, application longevity and portability. Portability means freedom from hardware vendors and the ability to finally distribute our information management. We look to our vendor to provide the gateways required to connect our new relational DBMS technology to older information systems," he explains.

The hardware gloves

Hardware has actually leaptfrogged software, with advances like very large-scale integration circuit technology, high-density memories, communications controllers and video controllers.

Users have become accustomed to the polished look of bit-mapped graphics in-

terfaces and to the instant response time of local processors.

"Accessing data using a character-based terminal attached to a DBMS residing on the corporate mainframe is like a time warp into the previous century for these users," says Carol Adams, office automation product manager for Sun Microsystems, Inc.

What the power of relational DBMS systems demands, according to Sharon Weinberg, president of Codd and Date Consulting Group, is the complementary power of parallel processing.

"Parallel processing is the computing architecture of the future, and relational technology fits it like a hand in a glove," Weinberg remarks. "A single relational request will execute a stream of instruc-

tions to perform many tasks that can be done in parallel. This is a lightning-fast operation when a CPU can be assigned to each task."

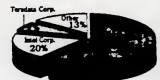
Contemporary supermicrocomputer architecture can provide millions of instructions per second (MIPS) for a price fiftyfold better than a mainframe, according to Kent Godfried, marketing manager for Sequent Computer Systems, Inc. "Our parallel processing users use tightly coupled parallel processing techniques that consist of banks of low-cost 32-bit microcomputer modules. These banks can be expanded linearly to make systems grow with customer needs."

Sequent offers a range of tightly coupled parallel processing systems that incorporate up to 30 CPUs, providing close to 100 MIPS of processing power in a single computer that can support more than 400 users.

Also targeting this market is Tandem, which is just completing beta testing of its Nonstop SQL, a parallel-architecture re-

Data base machines

1986 market share



INFORMATION PROVIDED BY INTERNATIONAL RESOURCE DEVELOPMENT, INC.

ational DBMS machine

The entry-level system can handle 200 transaction/sec. and, because of parallel architecture, can be expanded to more than 1,000 transaction/sec. Tandem supports distributed data bases with its Network Transaction Management Facility. Rollback and Rollforward recovery, as well as two-phased Commit and Presumed Abort allow distributed users the transparent ability to perform updates across multiple nodes with high data integrity.

Another interesting relational product targeting the same market is Sybase, Inc. in Berkeley, Calif. Significant architectural improvements from a multi-threaded data server and stored procedures have given this SQL-based system the speed to handle aggressive applications such as on-line transaction processing.

Caterpillar, Inc. has a large MIS shop, which has been a cornerstone of the IBM IMS community, having been involved in the initial development of IMS. In 1986, the CIM group at Caterpillar made a decision to adopt relational technology for future application development.

A distributed hardware architecture is now in place, using DB2 running on a mainframe and linked to a network of Digital Equipment Corp. VAX and Apollo Computer, Inc. workstations using Oracle SQL Star technology. Development is performed in the VAX and Apollo environments using Oracle, and completed applications access data stored on the mainframe. About 400 tables have been completed since the beginning of this year, with the largest having about 12 million rows.

The purpose of the relational DBMS system, according to Dick Lenz, senior

You Better Face Up To SUPRA.™

It's no wonder industry experts have called SUPRA the most advanced relational DBMS on the market.

Find out how SUPRA can take you to the heights of production. Send in the L or call us today.

You'll soon discover why no other relational DBMS can face up to SUPRA.

See Why DB2 Falls Prey To SUPRA.

Please send me the information on SUPRA: Literature Software Demo Diskette

My company is: Manufacturer Distributor Reseller Other

1-800-543-3010
In Ohio: 513-461-8000 In Canada: 1-416-279-4220

CINCOM

What we used to call competition,
we're now calling prey.

Name _____
Title _____
Company _____
Address _____
City _____
State _____
Zip _____
Phone _____

technical support specialist at Caterpillar, is to store manufacturing and design control information. The shift to relational will, it is hoped, provide a dynamic environment more suited to the changeable nature of manufacturing information and will allow the Caterpillar CIM group to manage and control information more easily than they could with IMS, Lens says.

Lens claims he is pleased with the outcome of the change. "Oracle solved our heterogeneous hardware problem. It is the kind of thing that you read about but don't really believe works. We wanted to do this project properly, so we took our time and developed a logical design of data within the organization. Our technology coexistence strategy, and major hurdle, is

to be able to develop transition programs that access both our IMS data and our relational data."

There is no way users can do this on their own, according to Lens. "We have to look to the vendors for support," he says. "We are looking to IBM or Oracle to provide us with key tools, such as an SQL interface to IMS."

Another example of the trend toward the migration of data base management from mainframes to minicomputers is provided by Boeing Computer Services Co. in Seattle. Boeing recently commissioned Integrated Automation, Inc. to develop a drawing and document storage and retrieval system. The system, which has the Ingres DBMS as its heart, runs on a network of DEC VAXs with 700M bytes

of magnetic storage devices and 64G bytes of optical-storage devices.

Operators use high-resolution displays to check the quality of engineering and documentation drawings fed in by many types of high-speed scanners. Once a drawing has been successfully input, it can be called back from the data base at will and examined or revised. Laser printers or plotters are able to give users hard copy, if desired.

Integrated productivity tools

Fourth-generation languages and related productivity tools such as report writers, screen painters and code generators all help developers speed applications from concept to final product.

With the upsurge of interest in applica-

tion productivity and portability, such tools have also become important for the buffering they provide between the applications and the hardware and operating systems. "The key to solving the technology coexistence issue," says Ron Hank, senior manager for corporate relations at Cincom, "is to have a language integrated into the DBMS so that the combined product completely handles all interfaces. Users can then move their applications from one environment to another, without having to change a single line of application code."

Amex Life Assurance Co. in San Rafael, Calif., which is using Cincom's Supra relational DBMS on an IBM mainframe with Cincom's Maniax application development language, has found that, with the productivity of these tools, more time can be spent on the philosophy behind the application rather than on the details of the implementation architecture and application coding.

Amex spent one year developing a strict entity relationship model of the

THE KEY to solving the technology coexistence issue is to have a language integrated into the DBMS so that the combined product completely handles all interfaces."

RON HANK
CINCOM SYSTEMS, INC.

company. The entity relationship model was developed in conjunction with a business model that defined the business rules of the company, and groups of users were interviewed by the MIS data designers in two-day joint application development meetings.

After these models were completed, a processing model was developed that showed which applications were on-line, which were to be batched and how data flowed between procedures. Finally, a technology model was developed that defined the hardware and software that would be used to implement the systems.

"It was a very interesting process to witness," says Lee McGee, data analysis specialist. "My senior management took the time to sell the other executives in the company on the importance of the process. Interacting with people and watching their reactions as they learned to think about our business from a modeling point of view was very worth while."

As Amex's time investment indicates, data modeling, once regarded as an academic exercise, is now considered a crucial step in the development process, largely because of the increased complexity of data base projects.

"Data modeling is not an esoteric pastime," says Chris Turnbull, president of Zantre Information, Inc. in Nepean, Ont., "but a very effective tool that helps data base designers to better solve real-world problems."

"In 1977, Peter Chen of MIT published a paper describing the entity relationship model, which constituted an important extension to the relational model. The model views the real world as being composed of groups of 'things' called entity sets and the relationships that we know

INFORMIX™ It's the fastest RDBMS for UNIX® And now it has a high-performance option that makes it even faster.

Introducing INFORMIX TURBO, the first fault-tolerant transaction processing database server for UNIX.

It lets INFORMIX SQL and INFORMIX 4GL fly through large databases. With features like optimized data layout, adjustable-size shared memory. And tunable performance parameters.

And to keep even the most demanding multi-user databases flying, there's our fault-tolerant feature. Which makes for speedy recovery from system crashes.

Of course, it's technology like this that has made INFORMIX the best-selling RDBMS for UNIX. And a leading contender in MS-DOS, VMS™ and networked systems.

For our latest benchmarks, graphs and more on INFORMIX TURBO, write Informix Software, 4100 Bohannon Drive, Menlo Park, CA 94025. Or call 415-322-4100. And bring your database up to speed.

INFORMIX

The RDBMS for people who know better.™

Coexistence

CONTINUED FROM PAGE 56

cost between these things," Zantke has created a data base product, called Zim, that allows data base designers to define a data base in terms of the entity relationship model, saving them the chore of having to convert a model into relational or traditional data base format.

Many vendors are focusing on speeding the process of developing a data model into a finished application. Data Language Corp. has specialized in this integrated language and DBMS approach with a product called Progress, which has received much critical acclaim. It was selected by NCR Corp. to be the vehicle for

all future in-house development.

Applied Data Research, Inc., developer of the powerful Ideal language environment, was impressed enough with Progress to purchase the source rights to integrate it into its product line. Data Language Corp. is just releasing an application generator that will help speed application development with Progress.

Another developer, Unify Corp., has opted to create a relational DBMS application development tool for the Unix and DOS environments. The product, called Accol, is said to help developers build transaction-oriented processing systems faster by using an event-driven system in which users fill out prompts and select items from menus. The resulting application is then linked to the data base.

Focus from Information Builders, Inc. is a strong product that is gaining momentum as it is migrated to more and more machine environments.

It is SQL, however, that is destined to become the Cobol of the data base world. SQL is a key component in linking disparate data base architectures. It is the only language interface to a data base that offers any kind of standard across manufacturers. This is very important to large organizations trying to tie the many data base systems into a network as well as to value-added resellers (VAR) that are interested in moving applications from one data base product to another.

Natural language interfaces are a specialized subset of the category of productivity enhancement tools. Natural lan-

guage products, available from companies such as Intelcorp or Natural Language, Inc., serve as front ends for query languages and provide a conversational means of accessing and retrieving data.

Technology brought to life

Data base technology has reached a plateau at which the tools exist to create extremely sophisticated applications. A shortfall occurs in the supply of skilled people who have sufficient understanding of how these new tools can be applied. To some extent, this gap is being filled by a growing cadre of VARs who are working to integrate relational DBMS technology into existing applications.

One example of this activity is provided by McDonnell Douglas Corp., which is acting as a VAR for Oracle in the computer-aided design (CAD) market. Recently, McDonnell Douglas interfaced the Oracle DBMS to its Graphics Design System (GDS) CAD system and created an interface product called SQL CAD.

HAVING superior technology is no longer the trump card in this business. . . . The relational DBMS vendor that flourishes will be the one that provides the best support."

PETER TIERNY
ORACLE CORP.

Paul Scarponico, product manager for DBMS and knowledge-based products at McDonnell Douglas Information Systems Group, explains what the addition of relational data base capability contributes to the product. "Users are now able to do some extraordinary things," he says.

"For example, the blueprint of a building could be created in GDS, and then a set of tables defining the attributes of the critical objects within the blueprint could be created with Oracle," he continues. "A query requesting the location of all fire extinguishers within the building could be entered into the system using SQL CAD, via its graphical interface. And the GDS would display all of the fire extinguisher locations on the blueprint as a graphic illustration."

Oracle has determined that, before the DBMS market evolves any further, there must be a period of integration and absorption. "Support training and education have been our marching orders," says Peter Tierney, vice-president of marketing at Oracle, adding that the funds raised by making the company public last year were not pumped into technology development or marketing as might have been expected but into the training of more than 250 consultants, the development of a network of 120 VARs and a testing up of the education and support staff.

"Having superior technology is no longer the trump card in this business," Tierney says. "Before long, every surviving relational data base vendor will have a similar technology, and they will all be excellent. The relational DBMS vendor that flourishes will be the one that provides the best support. Even the largest MIS shops must rely on the vendor for support. Helping users achieve technology coexistence is, at the center, a support is-



**"In the fashion business
three months is a lifetime.
IDEAL saved us years."**

—Bob Baily, Director
Information Services
Esprit de Corp.

The business world moves so fast today that no company can afford to let the process of developing applications slow them down.

That's why hundreds of companies like Esprit de Corp, the Dell Publishing Company and the Amstar Sugar Corporation use ADR IDEAL.

At Esprit, rebuilding their system with COBOL would have taken far longer than it has with IDEAL. They found that new development went three times faster with

IDEAL. Maintenance, five times faster. That's because IDEAL has a more efficient language. So programmers are able to get more work done with less code.

And IDEAL lets programmers work more efficiently. Their terminal becomes the single interactive workstation for all phases of development.

Programmers also work smarter with IDEAL. Its intelligent editors generate syntactically correct code. And its structured language builds programs that are

easier to understand and maintain.

And ADR can help you get the most from IDEAL with our pre-installation consulting service, training programs and worldwide support network that solves technical problems around the clock.

To learn how IDEAL can unlock the potential of your people and computers call 1-800-ADR-WARE.

ADR PERFORMANCE SOFTWARE.
Unlock the potential.

ADR

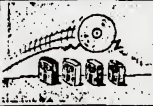
AN ORACLE COMPANY

Information Processing

NEWS & ANALYSIS

EDITED BY CATHERINE L. HARRIS

OPTICAL MEMORY'S PROSPECTS ARE FINALLY LOOKING UP



For years the computer industry has ballyhooed the optical disk, a laser-driven device that can store many times more data than a standard magnetic disk of the same size. Now, after numerous technical delays and false starts, the market may be hitting its stride. This year, 38 manufacturers worldwide, up from 21 last year, are supplying computer makers with 72 different optical drives, reports *Disk/Trend Inc.* in a new study. The Mountain View (Calif.) market researcher expects total worldwide revenues from optical drives to soar from \$203 million last year to \$1.4 billion in 1990.

With growth will come change. Right now, more than half the world's optical disk drive manufacturers are Japanese companies, which last year captured 92% of worldwide revenues. *Disk/Trend* expects them to hold their lead into the next decade. But it predicts that by 1990, U.S. makers will garner 23% of worldwide revenues, largely the result of the expected strength of International Business Machines Corp., a traditional leader in high-capacity storage devices. IBM came out with its first optical disk drive this year.

SURPRISE! HP'S NEW TERMINALS TAKE THE LOW ROAD ON PRICES

Hewlett-Packard Co. has always been known for its premium-price products. But the Palo Alto (Calif.) minicomputer maker is moving aggressively to change that, at least in the computer terminal market. On Sept. 1 it plans to start shipping new models with the lowest price tags in the business. And in a first for HP, some of those terminals will work with computers made by International Business Machines Corp. and Digital Equipment Corp. That should help boost HP's 1986 market share of 4.5%. Its five new models range in price from \$275 for general-purpose models to \$1,095 for the top HP-compact terminal. One model will be priced 28% lower than competitors' terminals that are compatible with the DEC VT220, while another will be 46% lower than IBM 3270s.

The products were designed around a handful of low-cost, interchangeable components, so labor will make up 3% of the total cost, says Larry D. Mitchell, general manager of the terminals division. That means HP can make terminals in the U.S. at about parity with those of rivals TeleVideo Systems and Wyse Technology, which manufacture in Asia.

MICROSOFT'S FALL COLLECTION IS DESIGNED FOR THE PS/2

Microsoft Corp., the No. 2 publisher of personal computer software, is about to make a full-scale push into applications programs for International Business Machines Corp.'s Personal System/2 computers. The Redmond (Wash.) company is expected to unveil a dozen or so new or enhanced products by the end of the year. For starters, it just announced a new version of Word, its popular word-processing program. The

next product—probably a new "mouse" device that lets computer operators run their machines without having to use their keyboards—will be announced at a New York bash on Aug. 21. The biggest announcement, a long-awaited new version of Microsoft's Excel spreadsheet, which now runs on Apple Computer Inc.'s Macintosh, is not expected until early October. Also expected by the end of the year is a new data base management program that might come from Bybase Inc., which is making an a pilot-general project for Microsoft. Analysts say that the Aug. 31 party may be a way to get attention for what might otherwise be an ignored event. But why throw a big bash when many of the invites are likely to be out of town? Says one pundit: "When you've got that many products to introduce, you've got to start somewhere."

EDGAR'S FUTURE AT THE SEC IS LOOKING BLEAK

The Securities & Exchange Commission's effort to computerize its operations is running into fresh troubles, and potential bidders for the Electronic Data Gathering & Retrieval (EDGAR) contract are growing increasingly skeptical about the project's future. The SEC issued its original request for proposals to automate its filing office in 1986, but no bidders responded. The main problem: The winner was supposed to pay for the entire system and then make money back by selling the SEC information. But the corporate financial data couldn't be copyrighted, so any other company could by the information once and resell it—for less—in direct competition.

Last month the General Accounting Office ordered the SEC to change its requirements and pay the costs for the computer hardware and internal operations itself. The 90-day clock for a new round of bidding won't start until the SEC releases a revised request for proposals. But skeptics aren't convinced the changes will draw in new bidders. Congress has only budgeted \$35 million for the next two years, by some estimates only a third of what the project will cost, and the shortfall leaves bidders' vendors worried. Ronald Plesner, head of an information industries team task force on EDGAR, says that "in some ways [those terms] could be more unattractive."

IS THE WORLD READY FOR DANISH MODERN PCs?

Are personal computer owners ready to mix high tech with high style? Three MBAs fresh out of Duke University think so. They have formed a new company called Casus Corp. to produce classy cases for PCs made out of richly finished oak, mahogany, cherry, or walnut. Exclaims one founder, Jeffrey L. Sparks, the Durham (N. C.) company's vice-president for operations: "You walk into a lawyer's office, and there's this ugly piece of putty-colored plastic sitting on a \$5,000 desk."

Casus believes computers should be as attractively packaged as stoneware. The \$266 package for the International Business Machines Corp. PC includes a new wooden keyboard, a miniature roll-top box for the main unit, and a cabinet with two doors for the monitor. A Macintosh version sells for \$355. The company, which incorporated in June, is hoping to entice computer dealers, catalog houses, and interior designers. But so far, it's finding its products a tough sale: It's only sold six.





SYBASE

2910 Seventh Street
Berkeley, CA 94710
415-548-4500

BUSINESS PLAN

JANUARY 5, 1987

SYBASE PROPRIETARY

Company Confidential

Copy No. 510

The Sybase, Inc. Business Plan is confidential and contains proprietary information including trade secrets of Sybase, Inc. Neither the plan nor any of the information contained in the plan may be reproduced or disclosed to any person under any circumstances without the express written permission of Sybase, Inc.

SYBASE, INC.

A SOFTWARE COMPANY DEDICATED TO BECOMING THE LEADER IN
HIGH PERFORMANCE RELATIONAL DATABASE MANAGEMENT SYSTEMS
FOR ON-LINE APPLICATIONS.

PRIVATE PLACEMENT DISCLAIMER

The information contained in this Business Plan is confidential and is intended only for the persons to whom it is delivered by Sybase, Inc. (the "Company"). Any reproduction of the plan, in whole or in part, or the disclosure of any of its contents without the prior written consent of the Company is prohibited.

The offering of the securities associated with this plan has not been registered with the Securities and Exchange Commission in reliance upon an exemption from registration contained in Section 4 (2) of the Securities Act of 1933, as amended (the "Securities Act"). The Securities and Exchange Commission has not passed on the merits of these securities nor has it reviewed this offering or any other selling literature.

No person has been authorized to give any information or to make any representations other than those contained herein.

This plan does not constitute an offer to sell or solicitation of an offer to buy any securities other than the securities offered hereby, nor does it constitute an offer to sell or solicitation of an offer to buy from any person in any state or other jurisdiction in which such an offer would be lawful.

Resale of the securities associated with this plan may not be made unless the securities are registered under the Securities Act, or unless resale is exempt from the registration requirements of the Securities Act.

Neither the delivery of this plan at any time, nor any sale hereunder, shall under any circumstances create an implication that the information contained herein is correct as of any time subsequent to its date.

Offers and sales will be made only to persons who have the knowledge and experience to evaluate the merits and risks of the investment and who have the economic means to afford the illiquidity of the securities offered hereby.

The information set forth is believed by the Company to be reliable. It must be recognized, however, that projections and predictions as to the Company's future performance are necessarily subject to a high degree of uncertainty and no warranty of such projections is expressed or implied hereby.

All corporate documents relating to this investment will be made available to an offeree and/or his representative upon appropriate request to the Company.

The Company shall be under no obligation whatsoever to sell or issue any securities referred to in this plan except pursuant to a duly executed stock purchase agreement between the Company and the purchaser.

The sale of the securities which is the subject of this offering has not been qualified with the California Commissioner of Corporations and the issuance of such securities or the payment or receipt of any part of the consideration therefor prior to such qualifications is unlawful. The rights of all parties are expressly conditioned upon such qualifications being obtained.

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY	5
2. MARKETING	8
3. INTERNATIONAL MARKETING	28
4. PRODUCTS	29
5. DEVELOPMENT PLANS	33
7. TECHNICAL SUPPORT	37
8. OPERATIONS PLAN	39
9. MANAGEMENT	40
10. RISKS	42
11. FINANCIAL	43

1. EXECUTIVE SUMMARY

Sybase™, Inc. was formed in November 1984 to design, develop and market high-performance relational database management software and interfaces for on-line applications. The initial development of our two products, the DataServer™ and the Data Toolset, is complete, the products are out at customer sites and we are building both our marketing and sales capabilities. Sybase will sell both SUN UNIX and VAX VMS product lines using our end-user sales force and also develop OEM relationships to leverage our sales into the on-line segments of the market that we can not address appropriately or in a timely fashion.

The initial funding for the company consisted of \$1,500,000 of venture capital (Hambrecht & Quist, Kleiner Perkins Caufield & Byers, and TRW), a \$1,000,000 development contract with TRW, and a \$500,000 lease line with United States Portfolio Leasing (USPL). This funding supported the design and development of our products. A second contract with TRW was signed for \$1,800,000, funding additional product development through 1987. A second round of venture capital for \$3,250,000 (Charles River Ventures and original investors) facilitated the initial building of our sales and marketing effort as well as funding the company through the beta site periods. A third round of financing of \$2,515,000 (Oak Investment Partners and previous investors) will support building our end user sales force and opening up Europe. These financings along with additional lease lines will support the company's projected growth as outlined below:

YEAR	1986	1987	1988	1989	1990	1991
REVENUE (\$000)	\$1,180	\$7,999	\$21,000	\$41,500	\$68,400	\$112,800
NET INCOME (\$000)	(\$2,707)	(\$1,300)	\$3,151	\$6,350	\$10,523	\$17,366

The market for Relational Database Management Systems is large and growing at a faster rate than the computer industry in general. The years 1980-1986 have seen relational systems sold successfully in the mainframe and mini markets. IBM's announcements of its relational products SQL/DS and DB2 help insure the market for relational systems. In addition, various Federal Government agencies have funded DBMS development in the past and are now very active purchasers of systems. While the potential number of Relational DBMS installations is large, there has only been significant penetration in the decision support segment of the marketplace. Penetration of the on-line segment has been limited due to the existing relational systems being slow, difficult to use, and not meeting the more stringent operational requirements.

The founders of Sybase have extensive experience with relational systems, having been involved in the development of INGRES and DB2 (host-based systems), and Britton Lee's IDM (a relational database machine). We are convinced, and our market research has shown us, that there is a substantial market opportunity for a relational DBMS that can address the requirements of the on-line segment of the market. The successful product must

Sybase and DataServer are trademarks of Sybase, Inc.

have the following characteristics: high-volume performance, DBMS enforced data integrity, security and consistency, high availability, distributed database management, and intelligent workstation oriented application tools.

The Sybase DataServer, Figure 1, is a high-performance, complete relational DBMS providing all the functionality required to compete in the on-line markets. The DataServer runs on general-purpose hardware and can connect to a collection of workstations and computers or function as a stand-alone database. The Data Toolset provides the user interface and application support functions and resides on one or all networked computers or workstations. The growing acceptance of local area networks spurred on by PC and workstation vendors is creating the demand for a means of storing data centrally but processing it locally.

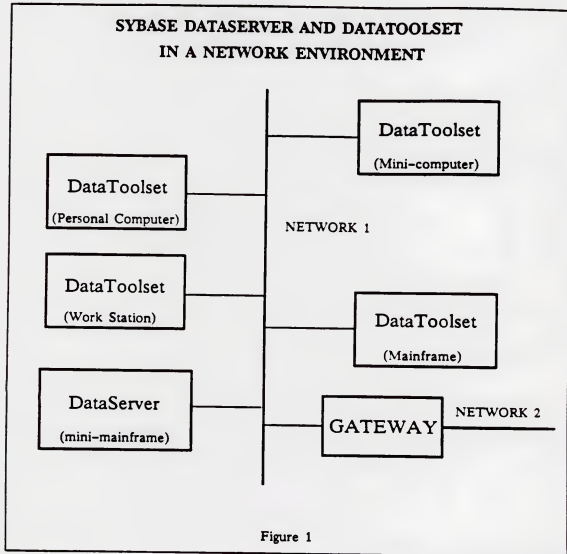


Figure 1

The Sybase DataServer is designed to achieve database machine performance on general purpose hardware. Current host-based systems are slow and are built around 1970's technology. They would have to be totally redesigned to achieve the significant improvements in performance and operational characteristics required to compete for on-line applications.

Database machines were designed to increase the speed of relational systems, which they did, but they require specialized hardware which makes support difficult or unacceptable to certain customers. Using hardware that costs less than half the price of a database machine, the Sybase DataServer has been benchmarked at higher transaction rates than current database machines. The DataServer software is portable, and faster CPUs will further increase its performance.

The DataServer is designed to fit into an operational, transaction-oriented environment and this on-line segment is where Sybase will focus its efforts. Features that are characteristic of most current non-relational, on-line systems such as the ability to back up the database or change the database structure without bringing down the system will open up this segment for Sybase. As decision support is also a characteristic of on-line applications, the Sybase products are also able to address those requirements in a superior manner.

Easy access to and integration of information and applications are essential to getting the full power and productivity of relational systems into the hands of programmers and nonprogrammers. The Sybase DataToolset provides a powerful set of query, report writing and application development tools to facilitate this access. Sybase believes the DataToolset differentiates itself from competitive products because it will allow increasingly complicated applications to be developed with easier-to-use tools. Providing these tools will help Sybase penetrate markets quickly by allowing our customers to develop applications faster.

Sybase's products are targeted to sophisticated 'Fortune 500' end users, government agencies, selected OEMs, and application developers (VARs). The application requirements that we are targeting will be characterized by a large number of concurrent users, on-line differentiating features as discussed above, large databases (>300 Megabytes) and have follow-on installations after initial application development. Due to the time required to get an OEM up and running, initial revenues will be achieved through sales made to end users and government agencies.

Computer manufacturers have added DBMS companies to their approved vendor list, but they have not been aggressively pushing the technology. In the current market, end users are demanding more integration from hardware vendors, forcing them to consider playing a more active role in the total solution. Current DBMSs provide only a part of that solution. Computer hardware manufacturers are reluctant to build their own relational database systems because they are expensive to develop, require specialized personnel, and are a distraction from their main line of business. The OEM market is a key area of Sybase's business. The Sybase products on OEM hardware can open up additional markets into which OEMs can leverage their hardware sales, something our competitors have not been able to provide. Sybase will also customize its products for OEMs. This demonstrates our commitment and can help them provide a total solution for their customers. Customization by Sybase will give certain of our OEMs a means of differentiating themselves in the marketplace. Our willingness to customize will also provide market differentiation for Sybase.

Sybase's managers have previously developed four other commercial DBMS products, and have considerable experience with this market. We believe strongly that Sybase is addressing a segment of the market destined to grow substantially and that our approach to solving the problems of on-line applications is well conceived, with significant proprietary technology to gain and protect a market advantage. Sybase is positioned to take advantage of this segment in which its competition is weak and because of that and projected segment growth both market share and revenue projections can be achieved in the projected time frame.

2. MARKETING

2.1 THE MARKET

DBMS Trends

The database management system market has been steadily growing since the early 1970's. It comprises one of the largest identifiable segments in the software business. Through most of the 70's, growth was concentrated in mainframes, and DBMSs were used to control the ongoing operations of large companies. These operations are frequently characterized by large centralized databases repeatedly processing similar transactions, with most reports done in batch mode. Primarily the domain of the DP department, such systems had few, if any, end user facilities for querying or updating the database.

By 1980, two developments started a major change in the DBMS market. The development of high-performance, low-cost super minicomputers such as the VAX 11/780, and the later development of supermicros such as the SUN 2/3, brought computing power directly into the hands of user departments who wanted to use DBMSs to solve their problems interactively. The primary DBMS architectures of the time were not suited to this type of application, but the other key development—the relational DBMS—was. Between 1980 and 1986 relational DBMSs have begun to dominate this market for new applications. In addition, the explosive growth of PCs within corporations is affecting the market. Users are now moving to integrate the PC as a workstation or low end application engine into their information networking strategies. The original PC DBMSs were not relational; however, the next generation (e.g., using the 386 with DOS 5.0) are expected to be dominated by relational products.

In the mainframe world, relational DBMSs are also coming into their own. The spread of the information center and the need for increased programmer productivity are motivating the growth in popularity of relational systems. On all computer types, from micros to mainframes, virtually every database product introduced in the last four years claims to be relational. Old style structured systems such as IDMS are being "reborn" as relational DBMSs (IDMS/R). The traditional and reborn DBMS products are rapidly losing market share because of the market's desire for SQL as a relational standard. From 1986 forward, relational is synonymous with offering SQL.

In 1986, the DBMS market for independent software companies was about \$650 million of which approximately \$200 million was for relational DBMSs. International Data Corporation estimates for growth of 30% per year puts the DBMS market at about \$1.8 billion in 1990. At that time, the DBMS market growth will be almost entirely relational with revenues expected to be \$1.2 billion.

At present, relational DBMSs generally run slower than the structured DBMSs of the last generation and do not have the operational characteristics required for on-line, transaction-oriented applications. Currently, RDBMSs primarily support smaller, decision-support oriented applications. So while the sales of the older style structured systems have slowed, they still are the only systems that meet the needs of the large market segment for on-line, transaction-oriented applications. The desire is clearly for a RDBMS that can address both on-line and decision-support applications.

Hardware Trends

The advent of low-priced, high-performance computers contributed to the success of relational DBMSs, and current trends in hardware development are promoting further changes in the DBMS market.

The first change is the spread of computer power due to increasingly cheap super minicomputers, and increasingly powerful desktop microcomputers. The VAX 11/780 of 1978 that cost \$250,000 is being replaced by the equally powerful MicroVAX II at \$42,000. The IBM PC/AT has the CPU power of mainframes of only 20 years ago. Prices have fallen for main memory and secondary storage as well as for CPU power. The introduction of optical disk storage will make it possible to store massive amounts of data at very low cost.

The second change is the proliferation of local area networks to tie together an organization's dispersed computing power and data storage resources. Users now want the capability to store data centrally and process it locally. From distributed locations, users want not only to query the database, but also to update it. This implies that as networks encompass ever greater numbers of computers, the number of users of the DBMS will steadily increase. Since it will be harder to control these users, it will be harder to maintain the integrity of the data.

These changes have important implications for the DBMS market. To succeed in the future, a DBMS must be able to function in a network environment. It must be able to accommodate vast amounts of data, large numbers of users, and a high rate of updates. Furthermore, the ability to centralize validation of data and ensure the constant availability of data are becoming more important. It must also provide user tools that fully exploit PC and workstation presentation services.

Market Segments

The database market can be divided along four main dimensions: the type of DBMS; the type of computer environment in which the DBMS is to run; the type of user; and the type of application. The market segments are defined by specifying each of these dimensions.

TYPES OF DBMS. There are two main types of DBMS. Structured DBMSs such as IBM's IMS or Cullinet's IDMS, and relational DBMSs. As was mentioned above, the trend is toward the relational approach, first proposed by E.F. Codd of IBM in the early 1970's. Designed to address the shortcomings of the structured DBMS of the time, it is only now that the relational approach is gaining broad acceptance. Until a relational system, such as the DataServer, can offer the performance and high availability of structured DBMSs, they will only be used for the development of modest decision support oriented applications.

TYPES OF COMPUTER ENVIRONMENT. The computer environment is defined by the hardware and operating system. The supermicro environment running UNIX, the VAX VMS environment, and the IBM VM environment have been targeted by most relational DBMSs. In addition, the predominate mainframe environment, IBM's MVS, must be considered as part of tomorrow's information networks which will require co-existence with IBM's DB2 RDBMS. The next generation PC using MS-DOS 5.0 and 386 CPUs will be important targets for relational vendors.

TYPES OF USERS. There are four main classes of prospective customers.

End Users. These are organizations, mostly Fortune 500 companies, which buy one or more DBMS for their own use. They may be subdivided into application users who buy the DBMS for a particular purpose such as a purchase order system or a shop floor control system and corporate users who are implementing a large number of integrated applications, such as a corporate budgeting and control system. In larger companies, an application may be distributed to many different sites. The buying decision is somewhat cost sensitive, but the primary issues are whether the system can solve the problem and whether it is reliable and supported. The decision makers are frequently those responsible for developing the application, as opposed to the data processing department which decides on the DBMS for the corporate database.

Government. While governmental agencies are similar to many large companies in their use of DBMSs, their different styles of procurement and their special needs make them a separate category. They frequently make use of outside consultants to purchase, implement, or maintain systems. While they tend to be application oriented, those applications are often replicated on many different computers within an organization. Although procurements are usually very competitive, and some are price sensitive, the decision is based on whether the system can solve the problem and is reliable and supported. Of particular importance in many government procurements is whether the system conforms to a standard hardware and operating system, and whether it supports the standard query language, SQL.

Value Added Resellers (VARs). This group implements a solution for a class of end user problems such as hospital accounting or manufacturing and sells the solution. While an application may be built on a DBMS, VAR customers are not purchasing the DBMS directly. The DBMS may be buried invisibly in the application. This market is characterized by extreme diversity, many competitors, and, in some cases, low margins. A VAR's decision to buy a particular DBMS is based on four factors that can provide them with a competitive edge: can they get to market sooner, does the DBMS provide superior functionality and/or performance, is it reliable and supported, and can they afford it.

OEMs. These are hardware or software vendors who are selling a DBMS as part of their offering. In some cases the DBMS may be private labeled. Most vendors offer more than one DBMS depending on the demands of their customers. Their buying decision is based primarily on perceived market demand for a product. This demand can express itself either through customer requests or specific features that enhance their ability to sell to a target market. In using OEMs, it is important to be sensitive to possible competition between OEMs and our end user sales force.

TYPES OF APPLICATIONS. The DBMS market has a broad base across many industries. This is because a DBMS is in many respects a system tool, and the characteristics of various applications are common to many industries. The features that determine the applicability of a DBMS to a particular task are its speed, the number of users it can support, its integrity and recovery capabilities, and its application development tools. Because of certain special needs, these tools may need to be further customized to particular applications. There are currently two broad categories of applications: decision support and on-line. The following table provides the key factors that separate these two classes:

APPLICATION CLASSES

	Decision Support	On-line
Description	Inquiry, Analysis and "Lite" Applications	Transactional "mission critical" Applications
Users	Small Numbers (<10)	Large Numbers (10's to 100's)
Tools	Conversational End-user Tools	Full Screen, Forms-based, Application Development Tools
Applications	Ad Hoc and Slowly Evolving Retrieval Intensive	Planned and Quickly Evolving Update Intensive
DBMS	Smaller Databases (<300 MB) Fast Response for Complex Retrievals	Larger Databases (>300MB) Fast Response and High Throughput for Complex Updates High Data Integrity High Data Security High Data Consistency High Operational Control High Availability

Segmentation Strategies

Currently, relational DBMSs are found primarily in the segment consisting of:

1. Supermini or supermicro hardware
2. Sophisticated end users assisted by data processing professionals
3. Decision support applications that are characterized by small numbers of users (usually fewer than 5 to 10), small to medium databases (under a half gigabyte), and an emphasis on retrieval as opposed to frequent updates or a high volume of transactions.

To broaden their base, many of the relational vendors have ported to large numbers of different supermicro and supermini computers. Some are also porting to IBM mainframes. The problems in this approach include: the almost linearly expanding support burden with each additional machine type or operating system; the solidly entrenched competition in the IBM market; and an inability to adapt to a changing marketplace resulting from the many versions of their software.

To avoid these problems, Sybase will focus on those computer environments that provide the greatest return. In addition, Sybase will expand the size of its prospective market by greatly increasing the class of applications for which its products are appropriate. In particular, the DataServer's great speed, ability to handle larger numbers of users, high data integrity, high availability, distributed database, and network orientation make it suitable for large on-line transaction oriented applications which find existing relational products too limiting.

Competition

Sybase faces three main sources of competition: data base machine companies, other DBMS software vendors, and hardware vendors. For all three types of competitors, the emergence of SQL as a standard language improves the Sybase position because existing SQL users can easily convert to Sybase's products to take advantage of their speed. It is also easy to implement QUEL (another popular relational language) on the DataServer, so that the migration path for users of Ingres and the Britton Lee DBMS machine can be smoothed if market demand warrants the effort. The following table shows the segmentation of every major product in the DBMS market.

COMPETITIVE SEGMENTATION

	Decision Support	On-line
Relational	MVS: DB2, Supra, Oracle VM: SQL/DS, Oracle, INGRES VAX: Oracle, INGRES, RDB Unix: Informix, Unify, INGRES DOS: Oracle, INFORMIX MS DOS 5.0 ?	MVS: DB2 VM: ? VAX: Sybase Unix: Sybase DOS: ? MS DOS 5.0 ? Other: IDM, Tandem*, Stratus*, Teradata
Non-Relational	MVS: Focus, Nomad, Adabase VM: Focus, Nomad, Adabase VAX: Datatrieve Unix: ? DOS: Focus, RBase MS DOS 5.0 ?	MVS: IMS, VSAM, IDMS/R, DataCom DB, TIS, 204 VM: VSAM VAX: DBMS 32, RMS Unix: C-ISAM DOS: Dbase III MS DOS 5.0 ? Other: Tandem, Stratus

* Relational DBMS not available yet

Database machines. One of the most important selection criteria for a DBMS is performance. Almost all major procurements require a demonstration of speed, sometimes against a standardized benchmark such as the DeWitt benchmark. The slow performance of software-based DBMSs led to the development of custom hardware designed to meet demands for high speed. There are two main DBMS machine companies: Teradata and Britton Lee, Inc. (BLI). Both companies base their computers on standard microprocessors. Teradata uses the Intel 8086, and Britton Lee the Zilog Z8000. Teradata is very expensive (in excess of \$250,000 for a basic machine) and is focused on the IBM marketplace. Their total installed base is fewer than 50 machines.

Britton Lee is the pre-eminent manufacturer of DBMS machines, with an installed base of over 500. A relatively expensive product, Britton Lee sells primarily to the government and end users on the basis of very high performance. Their market is limited by their use of special purpose hardware. Purchasers are forced to buy a computer for which there is relatively little support from what is (in hardware terms) a very small vendor. It is difficult for BLI to adapt to changes in CPU and storage technology because they lack the resources of a major hardware vendor. As hardware evolves, it is much easier for a software vendor to take advantage of improved price performance ratios. For example when DEC introduced the VAX 8600 or the MicroVAX II, software DBMSs that ran on VAX 780's had a relative improvement at zero cost to the software vendor. BLI is further limited in that they only supply third party front end tools.

Sybase products compete successfully with Britton Lee in four ways. First, they perform as well as or better than comparable BLI products. Second, Sybase products run on standard hardware, which makes them less expensive and easier to maintain. Third, Sybase supplies its own extremely functional front end tools. Fourth, Sybase's market research into the requirements of users has resulted in the implementation of many operational features that users need, but are not now getting from BLI.

Software DBMS. There are two main software companies in the relational DBMS marketplace. Oracle Systems Corp. offers Oracle, and Relational Technology Inc. offers Ingres. While not requiring custom hardware, these products are much slower than Britton Lee, and can not support many users. In addition, they are older products dating from the late 70's that do not reflect many of the advances in recent relational technology. According to a recent article by Dr. E. F. Codd (the developer of the relational model), they lack some of the features necessary to be fully relational systems. These features are not just academic considerations, but reflect on the usability of relational DBMSs. For example, neither system provides triggers to maintain the integrity of the database, which is essential in a distributed environment. Their major advantage is the market momentum that they both have. However, Sybase will have an advantage in the evolving market because of its faster speed, better application tools, better operational features, and orientation to a distributed environment.

There are second tier DBMS vendors, such as Informix Systems Corporation with Informix, and Unify Corporation with Unify. These products have been developed to handle small applications, and are only now entering the market for large scale applications. Their focus has been on the Unix supermicro market, where applications tend to be small. They lack the speed of the DataServer, the sophistication of the Data Workbench, and the operational tools necessary to handle serious applications. Neither organization has a significant end-user sales operation, which will limit their ability to enter the supermini and mainframe markets.

Hardware vendors. In our target market, some of the supermini vendors offer their own DBMS, and most offer one or more from a third party. Of particular interest to us are the DEC products VAX DBMS and Rdb. VAX DBMS is a Codasyl-style database positioned as offering performance, whereas Rdb is a relational DBMS (but not yet offering SQL) positioned as offering flexibility. Both of these systems require great skill on the user's part to be properly used. They also require the use of other DEC products that are not always well integrated. Furthermore, their performance is mediocre. These products represent competition primarily when the prospect is not going through a serious procurement but wants to stay with a particular hardware vendor. In our experience, the DEC sales force does not understand these products or how to sell them.

2.2 MARKETING STRATEGY

Positioning

Our fundamental positioning strategy is that SYBASE is the first RDBMS designed for on-line applications. We have addressed the significant shortcomings of existing products to make our products suitable for new segments as well as for segments in which relational DBMSs are already used. We have five differentiating features which satisfy key requirements for this market.

- 1) High-volume performance.
- 2) DBMS enforced data integrity.
- 3) High availability.
- 4) Distributed Database Management
- 5) Window-based Tools.

We will use this strategy to reposition our competition as offering limited decision support and light application products. If you can do on-line applications you can do decision support but it doesn't work the other way.

Our initial offerings are on supermicros and superminis running the Unix operating system, and on DEC VAX computers running VMS. In addition, the DataToolset front ends will run on IBM PCs (and compatibles) as well as on character and bit-mapped terminals. We will support TCP/IP and DECNET for communication between the DataServer and DataToolset. We offer a network product, but the DataServer and DataToolset can also run on the same computer. Thus, our product can be used like traditional relational DBMSs, while supporting more users at higher speed; as well as a dedicated database server. The supermini and supermicro markets are easier to enter than the mainframe market in that the cost of selling is lower and there is a willingness on the customer's part to go with a new system that shows promise. However, within three years our plan is to support all the major DEC, Unix, and IBM environments.

Sybase has developed the SYBASE RDBMS to meet the requirements of users who manage large databases with high transaction volumes and large numbers of users. The bulk of the future relational database market will fall into this category, and SYBASE is precisely positioned to take advantage of this market segment in which its competitors are weak.

Target Customers

In order to maintain focus, Sybase will target specific prospects in each of the four customer categories and sell successfully to qualified customers whose applications generally meet the

requirements for on-line systems. We expect to achieve 50% of our revenues from direct sales to system developers in 'Fortune 500' manufacturing, financial and telecommunications companies and to VARs which sell to these corporations. Thirty percent of our revenues will be from Federal government and 20% will be from OEMs.

End Users

End user sales are important for four reasons:

They create end user demand on hardware suppliers which motivates them to become Sybase OEMs.

They keep Sybase in touch with the market so that Sybase products are continually enhanced to reflect market needs.

They have a shorter sales and revenue cycle, which will produce revenue while the longer cycle of VARs and OEMs is completed.

There are a very large number of end user prospects, and they represent the highest per copy profit margins.

Sybase will initially sell to end users who are sophisticated and well aware of relational database issues. These customers will have had problems implementing applications with our competitors' products due to product limitations in performance, productivity, tools, and operational areas. These users will readily understand the Sybase advantage and therefore will have the shortest sales cycle.

Federal Government

The characteristics of many government applications are exactly those targeted by Sybase in its development effort, especially in the attention paid to supporting large high performance database applications. Of particular importance to government users is our commitment to support. To that end, we have a well-established field office located in suburban Washington to sell and support government clients.

OEMs

Sybase will sell to a qualified segment of the OEM market. These relationships are designed to leverage sales into complementary markets which we can't reach in a timely fashion or are too small for direct sales. In addition, they will provide R & D dollars for features that will accelerate our product development. Since Sybase will commit resources and efforts to the OEMs, we insist on a strategic and financial commitment from them. Sybase will not sign OEMs who intend merely to add our product to their price lists.

Sybase offers significant advantages to the OEM. Sybase will port to the hardware of its OEM customers and offer quality support which will include optimizing and tailoring the Sybase software for that OEM's hardware and customer base. Sybase offers the OEM a relational database product which does much more than allow that hardware vendor to be full service by having a database product. Sybase products on a vendor's hardware will deliver performance equal to or better than that delivered on special-purpose hardware. This allows a hardware vendor to sell its equipment to customers who previously would have needed special-purpose hardware, in other words, to sell to a new market—the *on-line* market. Selected end users will also create user demand for Sybase products among prospective OEMs.

Sybase is primarily interested in establishing an ongoing relationship with its OEMs in which they will commit to selling our product. Sybase will thus focus its resources on a few good OEMs. We expect the following from the OEMs:

PERIOD	AMOUNT
Development 3 to 9 months	All costs for porting special development, testing and equipment.
Shipment	Greater than \$1 Million royalty per year.

The \$1,000,000 per year ongoing revenue estimate is an easily attainable goal, since it is equivalent to only about 100 units per year for superminis.

Working with OEMs allows Sybase to avoid expensive internal hardware research, as is required by database machine vendors. The manufacturers supply the hardware research and development, and Sybase is free to concentrate all of its efforts on its software development.

VARs

Sybase will market to a select group of VARs. These application developers will have characteristics similar to end users. They will be sophisticated and well aware of relational database issues. As with end users, they will have had problems with current vendor products.

Sybase is packaging a special discounted version of the SYBASE RDBMS, which we call the SYBASE Run-Time System, that will enable VARs to ship a complete on-line application based on SYBASE, yet not compete with our end-user sales.

We expect the following revenue from each VAR:

PERIOD	AMOUNT
0 to 6 months	\$0
7 to 18 months	\$250,000
19 to 30 months	\$400,000
subsequent years	\$400,000

The size of this commitment is large. It implies that a VAR has annual revenues of about \$5 to \$10 million. We offer prospective VARs an unusual amount of support, the opportunity to get to market sooner because of our advanced tools, and the ability to lower the costs to the customers because of our extremely efficient use of hardware. In addition, our innovative royalty scheme enables them to maintain their profit margins.

Customer Base

The following table summarizes the target sizes of our customer base.

	86	87	88	89	90	91
END USER	20	75	200	350	550	750
VAR	1	10	30	60	75	90
OEM	2	4	5	6	6	6

Pricing

The price list shows that we are coming to market as a premium priced product. The very substantial advantages in product and service we offer justify this pricing. However, a very aggressive discount schedule is designed to keep us competitive, and to encourage buyers to stay with us. The computers listed under CPU class are examples only.

QUANTITY ONE, LIST PRICE

	DataServer	DataToolset*
Class 1 CPU Price	\$20,000	\$10,700
Sun 3, Sun 2 (DataToolset only)		
DEC MicroVAX II		
DEC Vax 725, 730,750		
Class 2 CPU Price	\$40,000	\$21,400
DEC Vax 780, 782		
DEC Vax 8200/8300		
Class 3 CPU Price	\$60,000	\$32,100
DEC Vax 785		
DEC Vax 8500/8550		
Class 4 CPU Price	\$80,000	\$42,000
DEC Vax 8600/8650		
Class 5 CPU Price	\$100,000	\$53,500
DEC Vax 8700/8800		
Class WS1 Price	-	\$1,000
IBM PC		
Class WS2 Price		
Sun Workstation (Sun 2 or Sun 3)	-	\$2,000

* DataToolset includes the Data Workbench, DB-LIBRARY (C, FORTRAN or COBOL), and APT-FORMS products which can be purchased separately.

END USER DISCOUNTS

Site discount	25% for multiple copies
Volume discount	0-25% applied to large single orders

OEM PRICING SCHEDULE

Discount Based on Dollar Commitment	30% to 70%
-------------------------------------	------------

VAR PRICING SCHEDULE

Price for SYBASE Run-Time	
Systems in each class	40% of DataServer and DataToolset quantity one prices

Promotion

Through 1987 we will be identifying and targeting industry analysts, editors, and specific prospects whom we will contact directly. Our promotion efforts will be concentrated on sales seminars, direct mail, articles and press coverage, industry publications, and participating in industry trade shows as speakers. Media advertising may start in 1987 but a large effort will start in 1988 when marketing needs to enlarge its prospect pool. We will also start exhibiting at selected trade shows in 1988.

Sales

Our sales efforts will be focused on specific End Users and VARs with targeted efforts to selected OEMs. In addition, we have already started working with specific federal government groups who have explicit and current needs for our products.

Support

Sybase commitment to support is very strong as it is the best way to get and keep customers. To that end, we established documentation and training departments at an early date. These departments have already produced high-quality documents and training materials. In addition, systems consultants are providing presales support and the technical services organization has an established telephone support organization for customer problem resolution.

2.3 MARKETING COMMUNICATIONS

Introduction

The primary goals of the marketing communications department are to increase Sybase's "share of mind" in the market place, to generate qualified leads for the sales force and to speed the sales cycle. These goals will be accomplished by carefully orchestrated lead generation strategies, collateral materials, and other services.

Lead Generation Strategies

PR PROGRAM

The goal of our Public Relations (PR) program is to educate key analysts and editors about Sybase's technology, market segment, and corporate progress, in order to obtain favorable recommendations and extensive press coverage. Blanc & Otus, our PR firm, has been assisting us in executing the program. Activities include:

- Press Liaison—establishing and maintaining contacts with key industry editors and analysts.
- Press Releases—preparing press releases and getting them placed.
- Press Materials—preparing appropriate materials (e.g., list of analyst quotes, corporate backgrounder, application stories)
- Press Tours—promoting product announcements for maximum press coverage.

- **Placing Technical Articles**—placing articles written by members of the Sybase staff.
- **Speakers Program**—identifying and coordinating speaking opportunities.
- **Public Relations Counsel**—ongoing input to our PR strategy.

VAX and SUN LEADS

Sybase has purchased the Computer Intelligence DataFile which lists approximately 8500 North American VAX sites. This information is now being placed in a Sybase database to serve as the basis for our sales seminar invitations and direct mail advertising program. Other lead sources will be evaluated and incorporated to expand our database of prospects.

SEMINARS

We have planned for 25 sales seminars during the calendar year. We will put on two series: a spring series and a fall series. A promotional invitation is being sent to the entire database, inviting them to come to a seminar at a hotel conference room. Each seminar will be scheduled for three hours. The program will consist of a general overview followed by a live demo or slide presentation of example screens.

DIRECT MAIL PROGRAM

Where possible, the direct mail program will be run in conjunction with the seminar invitations. We plan a quarterly mailing to the entire database of the Sybase "RDBMS Report." Each issue would focus on a topic of general interest as well as providing some SYBASE specific information. Each issue will list our seminar schedule.

BOB EPSTEIN BOOK

We recently tape recorded Bob's Performance Seminar and will try to contract with a writer to prepare a book from these tapes.

MEDIA ADVERTISING

We will experiment with this lead generation technique with a trial program in DEC specific magazines. This program will be watched carefully to ensure that our investment is worthwhile.

TRADE SHOWS

This area involves high expenses (booth design, booth moving, trade show fees) and it is not clear that there is a payoff here. In the short run, we can continue to make selected appearances at trade shows by appearing in the booths of our OEMs.

COLLATERAL MATERIALS

Marketing Communications is seeking a cohesive program of collateral materials, designed to complement and reinforce each other. Materials fall into one of two levels with the key pieces for each level presented below. Those marked with an asterisk are available at the time of this document's writing. New versions will be needed throughout the year.

LEVEL 1 (OVERVIEW MATERIALS)

- Sales Presentation* (with accompanying script)
- Sybase Foundation* (corporate officers)
- Corporate Backgrounder*
- DataServer Brochure*
- DataToolset Brochure*
- Interview with Sybase management*
- Corporate brochure (a high.level color brochure)
- Application Stories
- Newsletter/RDBMS Report (Quarterly newsletter that contains information of general interest about RDBMS, not just SYBASE)
- US Pricing*
- Non-Disclosure Agreement*
- Agreements* (general + VAR)
- SYBASE Training Program Overview
- Annotated List of Documentation
- Promotional gifts (e.g., coffee mugs, T-shirts)

LEVEL 2 (TECHNICAL OVERVIEWS)

- DataServer Overview*
- DataToolset Overview*
- Codd's Rules for RDBMS*
- DataServer 1.5 Performance*
- SYBASE Benchmark Database*
- SYBASE Transaction Model*
- In Search of a Useful RDBMS*
- Why RDBM's Don't Perform Well--Yet?*
- List of Supported Terminals*
- SYBASE Data Integrity* (technical paper)
- SYBASE Distributed Data Management (technical paper)
- Sample Database Evaluation (this would look like a completed RFP)
- Benchmarking On-Line Applications (Vax and Sun results for release 2.0)
- Relational DBMS Architecture for On-Line Applications (technical paper)

- Configuration Guidelines (This would answer prospect questions about how many users on a machine. It could also show that, by using hardware more efficiently, SYBASE saves the user hardware costs.)
- High Availability (technical paper)
- Data Dictionary (technical paper)

Additional Marketing Communications Services

SALES TRAINING

Marketing Communications will assist in the development of training materials for sales education. Examples include scripts for sales presentations and demos.

MARKETING MANUAL

Marcom maintains this binder that pulls together the newest versions of key documents and procedures.

USER GROUP

We will help develop a user group by first quarter of 1988. If we have a good core group prior to then, we may consider a meeting in the early fall of 1987. Marcom will need to play a central role in coordinating this group and its meetings.

SUSPECT DATABASE

Machine readable VAX leads have been placed into a SUSPECT database which will be used as a basis for the mass mailing program. As new leads are obtained from other sources, they too will be added to the database. Marcom has responsibility for maintaining this database. In addition to providing sales leads, the SUSPECT database will provide a mechanism for easily tracking sales opportunities and for building a model of the flow of business. Such a model could help us predict business for the coming six months.

GUEST SERVICES

Marcom will support a Guest Services program. Key prospects will want to visit Sybase, and Sales will coordinate each visit, drawing up an agenda, arranging for the prospects to meet the appropriate people, and making all the logistic arrangements.

2.4 PRODUCT MARKETING

The primary goals of the product marketing department are to ensure:

- 1) That Sybase's current products meet the requirements of its market segment.
- 2) That the sales force is properly supported with correct and timely product and competitive information.
- 3) That our future development efforts will optimally leverage our research and development dollars.

The primary functions to be performed are:

Product Management

- **Project Management**—ensuring that Sybase is producing complete products in a coordinated and timely fashion.
- **Product Planning**—helping development produce requirements and specifications for new products or new features for current products, prioritizing customer requests, and developing market analysis and business plans for entering new markets, or better exploiting our current markets.
- **Customer Analysis**—tracking and analyzing customer usage of Sybase's products.
- **Competitive Analysis**—analyzing competitive products and ensuring that development and sales are fully aware of our competitors' strengths and weaknesses.

Product Marketing

- **Collateral Development**—development of technical presentations, brochures, demos, and articles to support our sales and public relations efforts.
- **Pricing and Contracts**—develop product pricing, contract terms and conditions consistent with corporate goals.
- **Product Introductions**—train the sales force on how to best sell and support our products. Work with the marketing communication department to announce new products and capabilities to industry press and analysts.
- **Sales Support**—supporting key sales opportunities by providing special presentations, configuration analysis, benchmarking, and competitive information.

2.5 THE TECHNICAL PUBLICATIONS DEPARTMENT

Ambassadors and Guides

The Technical Publications department started writing about the Sybase products before the first line of program code was written. The first Overview of the DataServer and the DataToolset was based solely on detailed engineering specifications. Since April, 1985, when the first two writers began describing products under development, the Technical Publications department has added another writer and has developed a 10-volume, 1400-page set of overviews, user's manuals, and reference works.

Technical Publications' output reflects the breadth and depth of the capabilities of the DataServer and the DataToolset, and it also demonstrates that the company's early investment in documentation has paid off. Before joining Sybase, all of the Sybase writers had experience in writing about relational database management systems. In addition to describing the products, the writers have become Sybase's first "line of offense" in testing human factors engineering as well as new features and functions. The Technical Publications writers produce the on-line help messages, and they also edit all system error messages.

The Sybase documents must be both ambassadors and guides: they are a prospective customer's first in-depth contact with the products, and the new user's constant guide. The manuals play an important role both in marketing and in customer support.

Technical Publications collaborates with Marketing Communications on the overviews, and on trade journal articles and technical reports. Technical Publications has the opportunity to edit press releases, seminar announcements, and brochure text before publication. This exemplary cooperation between documentation and marketing ensures a unity of voice and style in Sybase publications.

How the Manuals Work

The Sybase document set is designed to satisfy both the inexperienced user's preference for simplicity and the experienced user's desire for convenience and comprehensiveness. The user's guides and reference manuals address the various needs of end users, application developers, programmers, and database administrators.

Each Sybase manual is fully illustrated with examples from the pubs Sample Database. The sample database contains tables that might be of interest to the publishing industry. The pubs database is shipped as a SQL script so that customers can install it at will. Each user can create a private set of pubs tables in order to practice the examples in the user's guides. The Sample Database contains a guest user mechanism that allows any authorized DataServer user to access it. The guest user has a wide range of privileges in pubs, including permission to SELECT, INSERT, UPDATE, and DELETE in all of the user tables.

The reference manuals serve both as quick reference tools and as detailed guides to the workings of the Sybase system. They document all the fine points of the system, and provide examples and illustrations.

Brief Description of the Sybase Documents

Sybase documents include:

- *The DataServer* (53 pp.)—an overview of the DataServer.
- *The DataToolset* (115 pp.)—an overview of front end programs, including the basic Data Workbench programs and the APT-FORMS screen painting program.
- *Data Workbench User's Guide* (300 pp.)—a comprehensive guide to SQL and VQL Queries, Format, Data Entry, Copy Table, DBO Utilities, Tools, Help, and Report Writer.
- *TRANSACT-SQL User's Guide* (380 pp.)—an illustrated tour of Sybase extended SQL query language, which adds programming capabilities to SQL while remaining upwardly compatible with IBM standard SQL.
- *Commands Reference* (200 pp.)—an alphabetical guide to the syntax and usage of every TRANSACT-SQL command, as well as a few special SQL concepts.
- *DB-LIBRARY Reference Manual* (100 pp.)—routines, system calls, and examples for the C functions of the interface library to the DataServer. FORTRAN and COBOL calls are available under separate license.

- *Sybase Installation Guide* (28 pp.)—covers the installation procedures for the Sybase software on Sun UNIX systems or VAX VMS systems. Installation guides for other operating system environments will be developed as required.
- *TRANSACT-SQL Quick Reference Card*—ready reference to TRANSACT-SQL syntax and Sybase system functions.
- *TRANSACT-SQL Reference Pamphlet*—expanded reference to SQL syntax, system functions, and system procedures.
- *Errata and Addenda*—published with each new release of the Sybase software.
- *APT-FORMS User's Guide* (150 pp.)—preliminary documentation for the APT-FORMS screen painting applications development tool.

2.6 CUSTOMER EDUCATION

The primary goals of the education department are to extend our sales and support efforts by ensuring that customers gain full value from our products and are successful in applying them through their correct and optimal usage.

EDUCATION FACILITIES

Sybase has completed the development of a one thousand square foot education facility at its headquarters. The facility consists of a class room and computer equipment capable of supporting 20 students. Each student has access to terminals for lab assignments. The facility also includes state-of-the-art terminal projection equipment so that instructors can easily give on-line demonstrations. Sybase is planning to develop additional educational facilities in other locations beginning in 1988. Customer education is expected to become a profitable operation in 1988.

CURRICULUM DEVELOPMENT

Sybase currently offers a three-day introductory course covering the SYBASE DataServer and DataToolset products. The curriculum will be greatly expanded in 1987 to include applications development as well as system performance analysis and tuning.

INTRODUCTION TO THE SYBASE RDBMS COURSE OUTLINE

1. Using the Data Workbench

Use of the Data Workbench as an application development and ad hoc query tool.

2. SYBASE Enhancements to SQL

Syntax and function of the SYBASE enhancements to SQL are covered.

3. Programmers' Tools in the SYBASE System (DB-LIBRARY; APT-FORMS)

APT-FORMS and DB-LIBRARY are covered for applications requiring host-language programming.

4. System Administration

Topics include installation, backup and recovery, setting up accounts and permissions, storage management, configuration of the systems parameters, error messages, and performance tuning.

5. Practice in Application Development with SYBASE

This is a lab to practice designing an application on the SYBASE system. Students will create tables, rules, defaults, triggers, stored procedures, and indexes.

3. INTERNATIONAL MARKETING

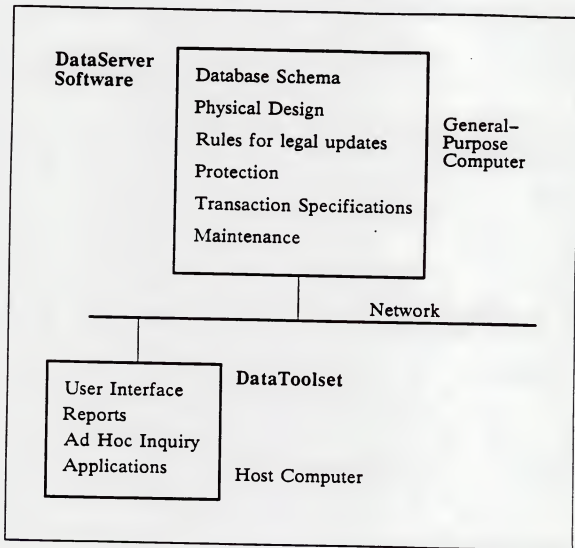
It is Sybase's intention to address the European market opportunity as soon as feasible in 1987. We do not consider Europe an afterthought but a marketing segment that must be developed along with our domestic opportunities.

Our European business plan will be completed over the next ninety days and will be distributed as an appendix to this plan.

4. PRODUCTS

The Sybase product line consists of two products categories: the DataServer and the DataToolset. The DataServer provides all the data management functions, and the DataToolset provides the user interface and applications support functions. Together, they provide a relational database management capability whose features and performance exceed existing competitive products. This section provides an overview of the software products: their distinguishing features, performance measurements, and key proprietary technology.

The diagram below outlines the features of the DataServer and DataToolset.



The two products are designed to communicate with each other through a communications network—typically a local area network. They will also perform well on long-haul networks of 240 bytes/second or more (by perform, we mean they will give subsecond response time in typical usage).

DataToolset

The DataToolset provides a consistent and easy-to-use interface for a user who needs to access the database. The interface is similar in style to the Apple Macintosh, Xerox Star, GEM and other modern interfaces. The goals of the user interface are to:

- Work transparently on bit-mapped terminals, character terminals or IBM PCs and compatibles;
- Work with or without a pointing device (typically a mouse);
- Provide an interactive development environment; and,
- Allow complicated operations to be performed with simple tools.

The DataToolset is the collective name for a set of interrelated and separately priced products consisting of:

DB-LIBRARY—Allows a subroutine level access to the facilities of the DataServer. This interface is used by all Sybase products. The DB-LIBRARY is priced separately for user applications which wish to communicate directly with the DataServer.

Data Workbench—End-user facility for *ad-hoc* inquiry and report generation, database design and administration, and data entry (see below).

APT—A set of application development tools. APT allows users to design their own presentation consisting of forms, fields and menus. The currently available portion of APT is called APT-FORMS.

The Data Workbench consists of the following components:

SQL—Allows a user to interact with the database using the SYBASE extended SQL language.

VQL—Allows a user to interact with the database using a *syntax-free* language. VQL stands for Visual Query Language. The user can construct queries to the database by selecting items from menus. VQL overcomes one of the hardest problems for new users of relational systems: the concept of the join. When a user wants data from two or more tables, VQL has a *rules-based* system for determining the most likely way the tables should be joined. In general we expect VQL to be a faster way to express a query than SQL.

DISPLAY—The display system outputs the results of a command written in either SQL or VQL. The most notable feature of DISPLAY is that it allows the user to modify the way data is displayed interactively, without using a language. Common display formats that could only be achieved with a programming language in many competitors' systems can be produced with a few *mouse clicks* or key strokes using DISPLAY.

REPORT WRITER—The Report Writer handles sophisticated reports that go beyond the capabilities of DISPLAY. The report writer does not require the use of a programming language. As with the other components, a user can create a report by modifying a visual image of the report.

The DataToolset provides a strong competitive advantage because of faster application development time; transparent use on PCs, character terminals and bit-mapped terminals; faster end-user response time; and reduced need for programming languages.

DataServer

The DataServer is a very high performance, complete relational DBMS. It has been designed to compete head-to-head in performance with database machines, but it runs on unmodified, general purpose computers. The DataServer has the following key distinguishing features:

Performance—The DataServer can provide subsecond response time to a large number of users on a multi-gigabyte database while running on hardware which costs less than \$60,000 (for 1 gigabyte of storage). While performance must be measured in a variety of ways, one basic metric is the time to fetch one random record out of one million. Sybase claims to perform this 25 times per second on 1 MIP (VAX 780 class) hardware. To date, we have been able to exceed this speed. These performance figures include all overhead associated with logging and multiple users.

Networks—The DataServer is designed to operate in a network environment. The DataServer can be accessed from a heterogeneous mix of computers. Competitive products (excluding database machines) have been designed to work with all programs running in a homogeneous environment and as a result have crude networking.

Data Integrity—The DataServer has the unique feature of allowing integrity rules to be defined in the database. For example, "You cannot remove a purchase order for which you have received parts." All existing relational DBMSs would require such an integrity rule to be supplied by an application program. By attaching such rules to the database, application development becomes simpler, and it is possible to change integrity rules without modifying application programs. This also enables integrity checking to be performed faster.

Operational Features—The DataServer is designed so that common maintenance operations can be performed without bringing the database off-line. For example the database can be dumped, columns can be added, views and stored procedures redefined, and damage can be repaired without bringing the database down. The DataServer includes complete facilities for logging and recovery as well as multiple user access to the database.

User Features—The DataServer is the third relational database which the principals of Sybase have built. As a result, it solves many of the significant problems which users have brought to our attention over the last eight years.

Proprietary Technology

Sybase possesses a large body of proprietary know-how which makes it difficult for a competitor to duplicate our capabilities and provides a substantial market entry barrier to any newcomers.

Low Multi-user Overhead—The DataServer's sophisticated software architecture can handle hundreds of users using only a small amount of memory. The DBMS runs as a single process which creates its own multi-tasking. This makes it easy to share information among users independently from the hardware and operating system environment. One consequence of this architecture is that a task cannot have any global variables. This makes it almost impossible to take an

existing DBMS and convert it to this architecture—it must be designed in from the start. Some direct benefits are that switching between tasks can be done in a fraction of a millisecond and a task only requires 16K of memory. Competitive systems typically require many milliseconds for a task switch and require up to 500K per task.

Compilation Techniques—Relational DBMSs provide a great deal of flexibility. Most support this flexibility at the expense of performance. They are *interpretive*. They recompile each query every time it is run in case the underlying database may have changed. SYBASE compiles a query once and then utilizes a technique to quickly see if the database has changed (it rarely has) since the last execution. If the database has changed, the query is transparently recompiled. The benefit of the SYBASE approach is that it allows complete flexibility in changing the database without imposing any performance penalty. By comparison, competitive systems use 20% to 300% more CPU time unnecessarily to compile a query.

TRANSACTION/SQL—ANSI standard SQL found on competitors' products is an incomplete language. It cannot be used for specifying complete business transactions—only a subset. As a result, logic which belongs in the Database must be replicated in every application. Sybase TRANSACTION/SQL is unique in its ability to specify entire procedures and conditional logic and store it as part of the Database.

Minimize Startup Overhead—Most operations against databases are very simple, so that databases repeatedly run many short transactions. The so-called *null* overhead—the time required to run the most trivial of commands—must be kept very low. Sybase has been able to keep this time under 7 milliseconds on 16Mhz 68020 hardware. By contrast, we believe competitive systems approach 50 milliseconds on VAX hardware.

Terminal Independence—A key design goal has been to hide all aspects of the display device (PC, terminal, mouse, etc.) from the user's application and from our own applications. Our technique for doing this is implemented in a package called *screenio*. The resulting product (Data Workbench) is highly portable, but it could not have been implemented without being entirely based on the screenio abstraction. Thus we feel it would be very hard for a competitor to move to our architecture without a near total rewrite—something which is very unlikely.

Internal Documentation—While documentation is typically considered to be a description of proprietary code, Sybase considers its capability to develop internal documentation to be a competitive advantage. We feel that our extensive internal documentation produces better products and allows us to work more productively in the long term. New employees have been able to come up to speed faster, and we expect the Technical Services group to be more independent as a result. We have been successful in creating a corporate culture which stresses the long term engineering requirements of products. Engineers consider documentation part of the development process and not an after-thought.

5. DEVELOPMENT PLANS

1987 Product Development

The majority of 1987 product revenue is dependent on the *core products*; that is, the DataServer, Data Workbench, DB-LIBRARY and APT-FORMS running on SUN 3 hardware and on VAX/VMS. In addition, many customer decisions will be based on our delivery of future products outlined in this section although actual direct revenue from the products will be minimal.

Sybase will support two networking protocols in 1987: TCP/IP and DECNET. Unix-based environments (SUN DataServer with VAX/Unix, IBM PC Toolsets) will depend on TCP/IP networks. VAX/VMS environments (VAX/VMS DataServer with SUN, IBM PC Toolsets) will depend on DECNET. We will also locate or develop RS232 based PC connections (see 4 below).

1. Delivery of core product for VAX/VMS (1Q 87). The DataServer, Data Workbench, DB-LIBRARY and APT-FORMS will be delivered for VAX/VMS customers utilizing MicroVAX through VAX 8800 running DECNET and using character terminals. Support for C, FORTRAN and COBOL languages will be provided. There is some possibility that support for the languages may extend into 2Q.

2. Delivery of Custom SUN Unix 3.2 for Database Machine (2Q 87). The SUN Dataserver has limited I/O capabilities due to the lack of user controlled disk I/O. Sybase will provide a modified version of SUN Unix which expands the I/O capability and also increases the number of possible connections from the SUN limit of 25 to several hundred.

3. Upgrades to Core Product (1Q, 2Q, 3Q 87). Improvements in performance and reliability and bug fixes will be supplied as needed to all core products to insure that customers can meet their production requirements. These releases will also be based on release 2 of the products.

4. IBM PC (2Q 87, 4Q 87). Support for the complete DataToolset will be provided for the IBM PC and compatibles during 1987. Two product categories will be developed. The first will allow any 8088 or larger PC running DOS 3.2 or later to support DB-LIBRARY using Microsoft C. The second will be limited to 80286 and larger PCs running 286DOS and will support the full DataToolset. This later product assumes that Microsoft will make 286DOS (also called DOS 5.0 in the press) generally available in the second half of 1987. As we have no way of confirming this, our product plans could change. Network support will minimally consist of Ethernet running TCP/IP. A study will be conducted in January 1987 to locate compatible networking products which would allow the PC to talk with VAX/VMS or SUN DataServers using any of: a standard serial port (RS232 compatible), NETBIOS, or DECNET. DB-LIBRARY is targeted for 2Q and is dependent on locating appropriate personnel. The DataToolset is targeted for 4Q. The dates may be accelerated once the complexity of the tasks have been completely assessed.

5. DataToolset on 4.3BSD (2Q 87). To meet specific customer requirements, the Data Toolset will be rehosted on VAX/Unix (BSD4.3). We will also investigate whether the binaries will run on VAX/Ultrix without modification. This project depends on receiving customer purchase orders before actual implementation. As such, the project could be dropped or moved to a later date.

5. **DataServer 3.0 (3Q or 4Q 87).** The next major product release of the DataServer will include limited support for an internal text/image data types, additional programming constructs added to TRANSACT/SQL, auditing support sufficient for a C2 security rating, and improved operational features. It will either be released independently or at the same time as the Distributed database version.
6. **Data Workbench 3.0 (3Q 87).** The Data Workbench improvements will be focused into a few areas. The Report Writer will be expanded to handle different report types and the user interface will be reworked in response to customer requests. The Data Dictionary module will expand to allow the creation and modification of objects. Currently that must be done through SQL commands. The user interface will be modified to make it faster, use less memory, allow terminal oriented customization and improve its general usability.
7. **APT (4Q 87).** The APT-FORMS product will be renamed APT and will be expanded to allow a greater portion of applications to be written without the need for a traditional programming language. APT will allow direct integration between forms, fields and TRANSACT/SQL. The Forms Processing Language (FPL) will be extended to provide conditional logic for manipulating fields.
8. **Distributed DataServer (4Q 87).** A separately priced DataServer product will be developed which allows multiple DataServers to exist in a fully distributed, transparent database. The product will exploit parallelism between the servers and will extend the TRANSACT/SQL language to specify distributed transactions. Through the use of distributed stored procedures, applications as well as data can be distributed.
9. **Text Workbench (4Q 87).** As part of Sybase's contract with TRW, a Workbench will be created which integrates external text management systems with the DataServer in a manner which is transparent to the application programmer and end-user. The text management will be performed by TRW's TextServer which is based on a proprietary text search hardware called the Fast Data Finder (fdf). This product is part of a longer term strategy to position Sybase into the On-Line Text market during 1988-89.
10. **Secure DataServer (3Q 88).** Under joint development with TRW, Sybase is re-architecting the DataServer release 2.0 to meet B2 security requirements. The goals for 1987 are to complete coding and begin final integration.

1988-89 Product Development

Product development in 1988 will focus on new environments, rounding out the DataToolset, and extending the distributed database capabilities of the DataServer. New environments will include IBM PC DataServer (which might be done in 1987) and VM. We will also start to develop VAR relationships for developing the Text Database products. To help users convert from Oracle, Ingres, and DB2, we will provide compatible precompilers. Sybase will also start development of physical database design tools for delivery in 1989.

We expect to cover the MVS environment in 1989, become a major player in the Text marketplace and produce a substantial product for Database design.

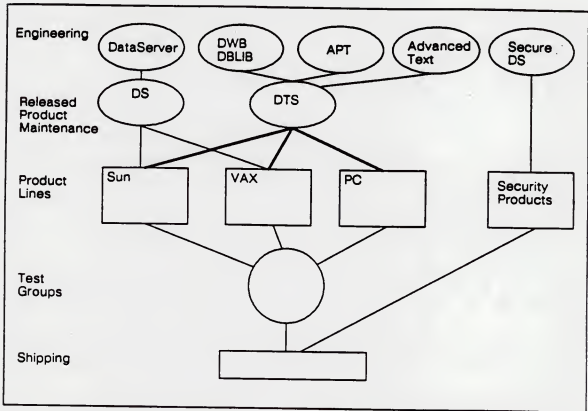
Engineering Product Flow

Our biggest new engineering challenges in 1987 are to make sure the products are successfully put into production use by ourselves and our customers, and to develop a

managerial structure which provides a smooth flow from initial development to customer acceptance.

To help insure that the products are successful in production use, we have developed a strong Technical Services organization. In addition, portions of Release 3 can be delayed if additional engineering help is needed to support the field.

To provide a smooth flow of product, engineering and technical services will transition into the organization shown below.



Engineering is organized into five product development groups: (1) DataServer (responsible for DataServer Release 3 and the distributed DataServer), (2) Data Workbench and DB-LIBRARY, (3) APT, (4) Advanced Text, and (5) Security products.

Technical Services is organized into four development groups: (1) Released Product Maintenance is responsible for environment-independent software once it is released, (2) Product Line Engineering groups are responsible for environment-specific software and for the overall success of a product line, (3) Software Quality Assurance is responsible for creating standardized test scripts and for final quality assurance of a product before it ships, and (4) Technical Support groups are responsible for the efficient, prompt, and technical assistance for end users.

OEM Engineering

Entering 1987, Sybase has two OEM contracts. Both call for delivery of products in 1987. OEM engineering receives standard products from the Released Product Maintenance groups

and adds OEM specific functions to the software. The OEM groups have their own separate testing. Shipping is performed by the OEM itself.

Both OEM contracts call for the development of a Multi-processor version of the DataServer. This work will be performed by the OEM group in the second half of 1987 for delivery in 1988.

7. TECHNICAL SERVICES

Sybase is a company committed to excellence in both its products and in the service it provides to customers. The Technical Services department consists of Software Quality Assurance, Released Product Maintenance, Product Line Engineering, and Technical Support groups working together to assure the release and maintenance of extremely high quality RDBMS software.

Sybase demonstrated this commitment to a superior product through its early establishment of a testing group. Our test cycle began in February 1985—two months before coding started. The first customers received copies of the DataServer and Data Workbench which had been subjected to over 10,000 hours of testing. This substantial investment of time and money is intended to produce an extremely reliable first release of the product and to establish Sybase's reputation as a vendor of software which far exceeds industry standards for reliability.

In contrast to common practice in the software industry, Sybase is building a strong Released Product Maintenance group, distinct from the research and development team, to maintain the DataServer and DataToolset. To aid this group in its task, the development staff has produced extensive maintenance documents for the code. While this kind of documentation is considered vital to any maintenance effort, the actual existence of such documents is very rare. With this separate group in place, the essential and time consuming task of software maintenance can be ongoing without interfering with the schedule for development.

The first members of the Released Product Maintenance group were hired and trained in early 1986 to prepare them for their full responsibilities now that products are in the field. As a way of establishing a feedback loop between support and development, DataServer and Applications Group specialists have joined the Released Product Maintenance team in a formal rotation cycle to add depth of knowledge to the group and bring a broader customer-oriented perspective to the development process.

The task of rehosting Sybase products from their development environment to production machines started as a cooperative effort between the development and Technical Services groups in 1986, and has now become the exclusive responsibility of the Product Line Engineering Department within the Technical Services organization. In addition to handling ports to new hardware, Technical Services will be responsible for intermediate level releases of the products that will include corrections of software problems. Removing these projects from the set of tasks development engineering performs and assigning them to Technical Services is another way in which Sybase is making the most efficient use of its engineering resources.

Providing a staff level appropriate to the demand for support is essential to customer satisfaction. On a daily basis, this means having a trained staff on hand to deliver a superior level of assistance to customers within a consistently reasonable time frame. Sybase plans one full-time technical support specialist dedicated to each OEM for every million dollars paid in royalties. Staffing levels for end user support are based on the following assumptions: a technical support staff member is able to respond efficiently to 15 end user contacts per day; during the initial high support demand period, a site may contact Sybase every day of the system's first month in operation and once a week during the following two months;

approximately one-fourth to one-third of all installations running mature applications will continue to place a significant, but lower than initial, demand on support resources. The demand on the support system and its response to those demands will be carefully recorded in a sophisticated database whose contents will be monitored to fine-tune the delivery of support to Sybase customers.

Sybase followed a conservative balance of support versus development for 1986. In order to ensure successful customer experiences with the first release of product, the company is emphasizing the establishment of a solid Technical Services group whose first responsibility is to assure a high-quality software package. In order to provide continuing reliability, Sybase is committing significant resources to Technical Support and Released Product Maintenance groups. New staffing will be concentrated in the Technical Services area, rather than in development groups, in 1987.

9. MANAGEMENT TEAM

Sybase's managers bring together an in-depth knowledge of the database arena that includes database architectures, applications development, market trends, sales, and operations requirements. In addition, many of these managers have previous experience in building a startup company. Presented below are highlights of prior experience:

Mark B. Hoffman, 40, President—Mark has an extensive financial and operations background gained while Vice President of Operations at Britton Lee (a leading manufacturer of special-purpose database computers) and while working at Amdahl in various manufacturing areas. He has an MBA from the University of Arizona and a B.S. in Engineering from West Point.

Dr. Robert S. Epstein, 34, Executive Vice President—Bob was previously Vice President of Development at Britton Lee and principal architect of its database machines. In the late 1970s he was project manager and chief programmer for INGRES, an early relational database management system. Bob holds a Ph.D. in Electrical Engineering and Computer Science from the University of California at Berkeley, specializing in distributed database systems. He has published many technical articles on database management topics.

Stewart A. Schuster, 41, Vice President, Marketing—Stu has extensive marketing and technical experience in the computer industry. He was previously Vice President of Business Development at Relational Technology, Inc., and has held management positions with Tandem Computers, Intel Corporation, and Panoramic, Inc. Stu holds a Bachelor of Science in Applied Mathematics from Washington University, St. Louis, and a Ph.D. in Computer Science from the University of Illinois, Champaign-Urbana.

Peter Mork, 43, Vice President, Sales—Peter has over twenty years of sales, marketing, and technical experience in the computer industry. He comes to Sybase from Ricoh Systems, Inc., where he was Vice President, Marketing and Sales. Previously, Peter spent twelve years with Data General Corporation in a variety of sales, sales management, international, and marketing positions. Peter attended Marquette University in Milwaukee, Wisconsin.

David M. Turner, 33, Vice President Finance and Operations—Dave was the Sybase Controller from April 1985 to October 1986. Prior to that he was the Director of Materials for Britton Lee, Inc., a manufacturer of database computers. Dave's background has been one of operational and financial responsibilities at Britton Lee and at Amdahl. Dave has a B.A. in Industrial/Organizational Psychology and an MBA with an emphasis in Finance from the University of Santa Clara.

Dr. Ann Merrill, 30, Director, Technical Services—Ann was previously the manager of Technical Support at Relational Database Systems, Inc. where she was responsible for customer and technical support, porting and testing of that database product. Prior to that Ann worked in several projects at U.C. Berkeley involved in analyzing hardware and software requirements for university projects. Ann holds a Ph.D. in Anthropology from the University of California at Berkeley and an A.B. from Radcliffe College, Harvard University.



Donna L. Jeker, 34, Director, OEM Marketing—Donna was Group Product Manager at Bank of America responsible for developing and marketing a product line of computerized portfolio systems targeted at large corporations. Donna has a B.A. in Physics from Mount Holyoke College and an MBA with an emphasis in finance and management information systems from the University of Chicago.

Jane Doughty, 32, Manager, DataServer—Jane is experienced in all aspects of database system development. She has worked for Britton Lee, IBM (on IMS and DB2), Datapoint, and the INGRES project. Jane holds a Master's degree in Computer Science from the University of California at Berkeley.

Thomas Haggin, 36, Manager, Data Workbench—Tom has a broad background in developing end-user applications. He was Software Services Manager at Britton Lee, responsible for management information services, software testing and quality assurance, and computer operations. Tom has a Master's degree in Information Science from the University of California at Berkeley.

Sandra L. Emerson, 39, Manager, Technical Publications—Sandy was previously a teacher, consultant and free lance writer. She has published articles in *Datamation*, *BYTE* and *UNIX Review* and co-authored *Database Management for the IBM PC*, *The Business Guide to the UNIX System* and *Troff Typesetting on UNIX Systems*. Sandy has written and revised user manuals for Pacific Software and Relational Database Systems, Inc. Sandy holds an M.S. in Health Education from the University of Toronto and a B.A. in English from Duke University.

Richard A. McIntosh, 38, Manager, Product Line Engineering—Richard was previously a Manager of Software Development and Technical Services at UC Berkeley where he developed, maintained, and ported software to multiple operating systems. Richard has an A.B. and an M.A. in Political Science from the University of California at Berkeley.

Nancy Thomason, 29, Manager, Education—Nancy joined Sybase from Cullinet Software, Inc., where she was the course developer for the National Education Center. Her other experience includes previous training and programming responsibilities. Nancy holds an A.B. from Mount Holyoke College.

Richard Scheffer, 43, Manager, Marketing Communications—Rich joined Sybase after four years with Relational Technology, Inc., in a variety of sales and sales management positions. Rich holds a B.A. from Princeton University and an M.A. in Communications from Stanford University.

10. RISKS

The products are now at a stage with the difficult foundations complete, detailed specification of the product through first customer ship complete, and the final customer ship coding in process. There is, therefore, no engineering risk remaining on the base products, only the potential for schedule slippage on those additional pieces of product required to have a full SUN and VAX product line, i.e., APT-FORMS, COBOL and FORTRAN interfaces, and APT-PRO. The principal risks remain in marketing the products. We have had significant contact with potential customers to validate the interest in and the advantages of our products and also to validate our planned method of doing business with OEMs. Revenue plans for 1987 are very aggressive and have to be precisely executed to ensure that growth.

RISK ASSESSMENT

(LISTED IN ORDER OF GREATEST CONCERN)

SCHEDULE SLIPS IN ROUNDING OUT PRODUCT LINES

ACHIEVING SALES PROJECTIONS

- HIRE SALES FORCE PER PROJECTIONS
- ACHIEVE QUOTAS BASED ON REVENUE MODELS
- SPEED AT WHICH OEM WILL GET PRODUCT TO MARKET

MAY BE TOO LATE FOR SOME MARKETS

- CAN NOT DISPLACE COMPETITORS DUE TO DECISIONS ALREADY MADE

MARKET DIFFERENTIATION

- DOES MARKET DISTINGUISH US FROM COMPETITORS

COMPETITION MOVES CLOSER TO OUR MARKETING STRATEGIES

FOCUS

- MAINTAIN REASONABLE ENGINEERING GOALS
- CONCENTRATE ON CUSTOMERS WITH BIGGEST BANG FOR THE BUCK

11. FINANCIAL

The initial round of funding for Sybase was for \$3,000,000. This consisted of: \$1,500,000 of venture funding provided by Hambrecht & Quist, Kleiner Perkins Caufield and Byers, and TRW, a \$1,000,000 development contract with TRW, and a \$500,000 lease line with USPL. This funding was sufficient to achieve product design and development.

The second round of funding totaled \$6,050,000. In December 1985, a contract was signed with TRW for \$1,800,000. Approximately \$1,000,000 of this revenue was received during 1986. The remainder will be billed over the next year and represents all of the TRW contract revenue shown on the sales projections through third quarter 1987. In 1986, lease lines for \$1,000,000 were established with USPL. The final piece of the second round funding was \$3,250,000, raised from the sale of equity in May of 1986.

A third round of equity funding was closed in December 1986. The funding totaled \$2,515,000. In addition, a capital equipment lease line of \$1,000,000 will be closed in January, 1987.

Management took a very conservative approach in its formulation of the financial statements. As indicated on the cash flow statements, Sybase's lowest cash balance occurs in June of 1988. This point is very sensitive to accounts receivable (A/R) fluctuations. By the fourth quarter of 1987 Sybase will be able to draw on funding from an A/R line of credit to help with the fluctuations. This A/R funding is not included in the cash flow spreadsheets. The cash flow assumes an average A/R of 75 days. We believe with software products and OEMs on a royalty basis this 75 days will not be out of line. We also wanted to maintain a \$1,000,000 cushion for any other problems that might occur. Through this critical period we must be very aggressive in collection and contain our expenses.

1-2-87

SYBASE QUARTERLY REVENUE PROJECTIONS
1986-1991

	1986 (actual)				1987 (projections)				1988			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Maint.train.doc	4	11	0	4	17	44	64	138	188	303	398	501
Contract	450	100	175	75	200	125	180	307	300	300	150	250
DEM	0	0	0	12	66	110	402	788	819	1302	1353	2126
International	0	0	0	0	0	0	0	0	175	225	275	325
Domestic	0	0	0	354	596	1180	1662	2100	1716	2830	2830	4724
TOTAL	454	111	175	445	879	1459	2528	3333	3198	4960	4916	7926
COGS	56	28	34	93	69	129	192	257	308	480	472	770
NET	398	83	141	352	810	1330	2136	3076	2890	4480	4444	7156
yearly revenue				1185				7999				21000
yearly COGS				211				647				2030
gross profit				974				7352				18970
	1989				1990				1991			
Maint.train.doc	500	625	625	750	1000	1250	1250	1500	1680	2100	2100	2520
Contract	200	250	250	300	200	250	250	300	200	250	250	300
DEM	1600	2000	2000	2400	2360	2950	2950	3540	3640	4550	4550	5460
International	1200	1500	1500	1800	2400	3000	3000	3600	4000	5000	5000	6000
Domestic	4800	6000	6000	7200	7720	9650	9650	11580	13040	16300	16300	19560
TOTAL	8300	10375	10375	12450	13680	17100	17100	20520	22560	28200	28200	33840
COGS	704	880	880	1056	1189	1486	1486	1783	1987	2484	2484	2991
NET	7596	9495	9495	11394	12491	15614	15614	18737	20573	25716	25716	30859
yearly revenue				41500				68400				112800
yearly COGS				3520				5944				9936
gross profit				37980				62456				102864

1-6-87

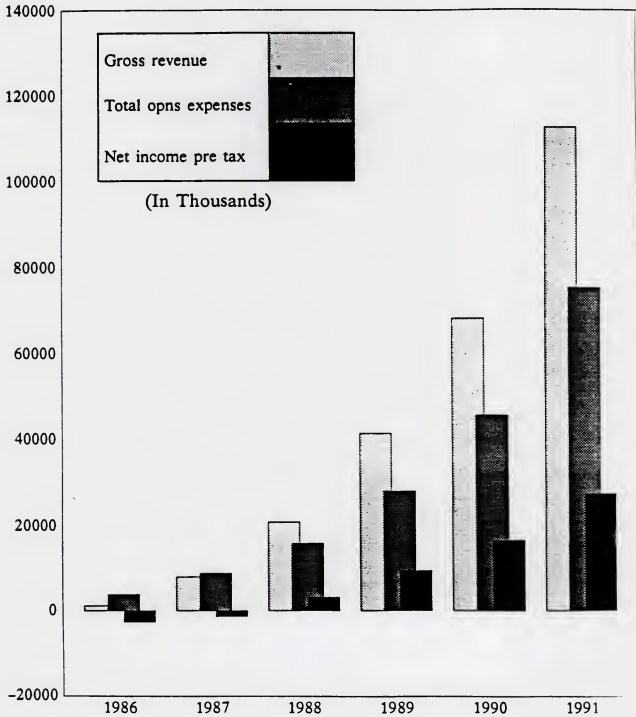
SYBASE QUARTERLY PRO FORMA
STATEMENT OF OPERATIONS
1986-1988
(\$000)

	1986 4Q	1987 1Q	2Q	3Q	4Q	1988 1Q	2Q	3Q	4Q
revenue	445	878	1459	2328	3333	3198	4960	4916	7926
cost of revenue	93	69	129	192	257	308	480	472	770
gross profit	352	810	1330	2136	3076	2890	4480	4444	7156
quarterly expenses									
Engineering	320	432	512	543	577	605	886	886	1132
Marketing	461	294	275	297	288	527	667	697	790
Tech Services	228	431	493	531	554	566	828	864	1059
Administration	191	272	283	285	293	307	449	479	574
Operations	58	71	79	97	95	100	148	156	198
Sales	0	355	449	517	573	633	912	970	1156
OEM Marketing	0	53	56	70	61	64	93	99	119
Total	1258	1907	2148	2338	2438	2802	3981	4171	5016
operating income	-906	-1097	-818	-202	637	88	499	273	2140
interest income	12	35	33	30	27	30	40	40	55
interest expense	0	0	0	0	0	3	3	4	4
net income, pre-tax	-894	-1062	-785	-172	684	115	536	309	2191
NI/revenue	-2.01	-1.21	-0.54	-0.07	0.20	0.04	0.11	0.06	0.28

SYBASE YEARLY PRO FORMA
STATEMENT OF OPERATIONS
1986-1991
(3000)

	1986	1987	1988	1989	1990	1991 % of sales 1987	1988	1989	1990
revenue	1180	7999	21000	41500	68400	112800			
cost of revenue	210	647	2030	3520	5944	9936			
gross profit	970	7352	18970	37980	62456	102864			
quarterly expenses									
Engineering	1238	2063	3508	5103	8278	13671	0.26	0.17	0.12
Marketing	1136	1153	2681	4066	6688	11120	0.14	0.13	0.10
Tech Services	604	2009	3337	5103	8278	13671	0.25	0.16	0.12
Administration	658	1132	1809	3798	6246	10288	0.14	0.09	0.09
Operations	161	342	588	1899	3123	5143	0.04	0.03	0.05
Sales	0	1893	3871	7585	12161	20053	0.24	0.17	0.18
OEM Marketing	0	240	375	654	1077	1777	0.03	0.02	0.02
total	3797	8832	15970	28208	45846	75722			
operating income	-2827	-1480	3000	9772	16608	27142			
interest income	120	125	165	221	875	1586			
interest expense	0	0	14	14	18	21			
net income, BT	-2707	-1355	3151	9879	17465	28707			
NIAT/revenue	-2.29	-0.17	0.15	0.24	0.26	0.25			
cum. net income	-31	-2934	-4289	8841	28305	55013			
taxes	-196	0	0	3271	8462	10822			
net income, AT	-2707	-1355	3151	6708	11003	18086			
NIAT/revenue	-2.29	-0.17	0.15	0.18	0.16	0.16			

YEARLY PRO FORMA CHART



P & L FINANCIAL ASSUMPTIONS

1. REVENUE IS BASED ON THE CUSTOMER MODEL DESCRIBED IN THE BUSINESS PLAN.

2. COST OF REVENUE (COR) IS BASED ON THE FOLLOWING MODEL:

10% of end-user revenue + 3% of contract revenue.

3. EXPENSES ARE BASED ON A DETAILED PROJECTION OF QUARTERLY HEADCOUNT AND EXPENSES THROUGH 1987, AND ON THE PROFIT AND LOSS STATEMENT THEREAFTER.

4. ALLOCATED EXPENSES FOR 1988 -1990 FOLLOW THE PERCENTAGES LISTED BELOW.

9% - G & A
12% - ENGINEERING
12% - TECHNICAL SERVICES
12% - MARKETING
18% - SALES
5% - OPERATIONS
10% - COST OF REVENUE (see above)
22% - OPERATING INCOME

5. DEPRECIATION IS BASED ON THE FOLLOWING CAPITAL PURCHASES DEPRECIATED OVER FIVE YEARS. THE DEPRECIATED PURCHASES INCLUDE LEASEHOLD IMPROVEMENTS AND SOFTWARE NOT FINANCED WITH AN OPERATING LEASE.

1986 - 75,000
1987 - 77,000
1988 - 200,000
1989 - 240,000
1990 - 240,000
1991 - 360,000

6. INTEREST INCOME IS BASED ON AN INTEREST RATE OF 5.5%.

7. SYBASE HAS AN OPERATING LEASE TOTALING \$2.5 MILLION TO COVER 1985-1987 R & D EQUIPMENT AND OFFICE FURNITURE. LEASE PAYMENTS ARE INCLUDED IN MONTHLY EXPENSE FIGURES.

1-2-87

 SYBASE QUARTERLY BALANCE SHEET
 1986-1991
 (\$)

	1986 4Q	1987 1Q	2Q	3Q	4Q	1988 1Q	2Q	3Q	4Q	1989	1990	1991
Cash & Equivalents	4368694	3025430	1877794	1145669	1445487	1637792	1255717	1575443	2121236	8348918	13165756	24461007
Receivables	250000	566000	872667	1552000	2222000	2131771	3306779	3277420	6284031	8300000	13680000	22560000
Inventories	0	0	0	0	0	0	0	0	0	0	0	0
Total current assets	4616694	3611430	2850461	2697669	3667487	3769563	4562496	4862663	7405268	14649918	26845756	47021007
Property & Equipment	75000	78000	81000	84000	152000	197000	245000	288000	350000	590000	830000	1190000
Depreciation	7500	11400	15450	19650	27250	37100	49350	64150	81650	199650	398050	798050
Net	67500	66600	65550	64350	124750	169900	195650	231850	268350	390350	431950	391950
Total assets	4684194	3678030	2916011	2762019	3792237	3929463	4758146	5084713	7673618	15040268	27277706	47412957
Liabilities & Stockholder's equity												
Bank borrowing	0	0	0	0	355520	341083	529086	524367	645446	1328000	2188800	3609600
Leases current	0	0	0	0	0	0	0	0	0	0	0	0
Accounts payable	104833	158939	178963	194867	203268	233500	331750	347583	418000	587667	955175	1577533
Total current liabilities	104833	158939	178963	194867	558788	574583	860836	871871	1263446	1915667	3143975	5187133
Long term debt	0	0	0	0	0	0	0	0	0	0	0	0
Total liabilities	104833	158939	178963	194867	558788	574583	860836	871971	1263446	1915667	3143975	5187133
Stockholder's equity												
Preferred stock	7250000	7250000	7250000	7250000	7250000	7250000	7250000	7250000	7250000	7250000	7250000	7250000
Common stock	250000	257000	273750	290500	307250	350125	393000	436675	478750	521625	564500	607375
Stockholder notes receivable	-22250	-28250	-42486	-56726	-70963	-107406	-143950	-180294	-218738	-253161	-289626	-328089
Add'l paid-in cap. warrants	3250	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250
Retained earnings (prior)	-2000208	-2901639	-3863909	-4748465	-4920673	-4257089	-4142089	-3608089	-3297089	-1106899	5601909	16604608
Retained earnings (current)	-901431	-1062270	-784566	-172408	663764	115000	636000	309000	2191000	6707996	11062698	18085662
Total stockholder's equity	4579361	3519091	2737048	2567152	3233449	3354880	3897311	4212742	6410174	13124601	24133731	42226824
Total liabilities & stockholder's equity	4684194	3678030	2916011	2762019	3792237	3929463	4758146	5084713	7673618	15040268	27277706	47412957
Current ratio	44.04	22.72	15.93	13.84	6.56	6.56	5.30	5.57	5.88	7.65	8.54	8.06
Debt to equity ratio	0.02	0.04	0.06	0.07	0.15	0.15	0.18	0.17	0.16	0.13	0.12	0.11
Working capital	4511861	3452491	2671498	2502802	3108699	3194980	3701661	3980892	6141824	12734261	23701781	41833874

SYBASE Proprietary (1/5/87)

SYBASE YEARLY BALANCE SHEET
1986-1991

	(\$)					
	1986	1987	1988	1989	1990	1991
Cash & Equivalents	4366694	1445487	2121238	6349918	13185758	24461007
Receivables	250000	2222000	5284031	8300000	13680000	22560000
Inventories	0	0	0	0	0	0
Total current assets	4816894	3687487	7405268	14649918	26845758	47021007
Property & Equipment	75000	152000	350000	590000	830000	1190000
Depreciation	7500	27250	81650	199650	398050	798050
Net	67500	124750	268350	390350	431950	391950
check	4684194	3792237	7673618	15040268	27277706	47412957
Total assets	4684194	3792237	7673618	15040268	27277706	47412957
Liabilities & Stockholder's equity						
Bank borrowing	0	355520	845445	1328000	2188800	3609500
Leases current	0	0	0	0	0	0
Accounts payable	104833	203268	418000	687667	955175	1577533
Total current liabilities	104833	558788	1263445	1915667	3143975	5187133
Long term debt	0	0	0	0	0	0
Total liabilities	104833	558788	1263445	1915667	3143975	5187133
Stockholder's equity						
Preferred stock	7250000	7250000	7250000	7250000	7250000	7250000
Common stock	250000	307250	478750	521825	564500	607375
Stockholder's notes receivable	-22250	-70963	-216738	-263181	-289625	-326089
Add'l paid-in cap. warrants	3250	4250	4250	4250	4250	4250
Retained earnings (prior)	-2000208	-4920873	-3297089	-1106088	5601908	16604606
Retained earnings (current)	-901431	663784	2191000	6707998	11002699	18085662
Total stockholder's equity	4579361	3233449	6410174	13124601	24133731	42225824
Total liabilities & stockholder's equity	4684194	3792237	7673618	15040268	27277706	47412957
Current ratio	44.04	8.58	5.86	7.65	8.54	9.06
Debt to equity ratio	0.02	0.15	0.16	0.13	0.12	0.11
Working capital	4511881	3108699	8141824	12734251	23701781	41833674

BALANCE SHEET ASSUMPTIONS

1. RECEIVABLES

Receive payment at 60 days for non-contract sales, 30 days for TRW contract.

Used 2/3rds of quarterly revenue.

2. INVENTORIES

SYBASE does not anticipate any in-process inventory.

3. CAPITAL EQUIPMENT IS DEPRECIATED OVER 60 MONTHS

4. ACCOUNTS PAYABLE

1986 - 1987 = Expenses from detailed budget payable at net 30

1988 - 1991 = Expenses from the profit and loss statement

5. BANK BORROWING

1987 - 1991 = 16% accounts receivable line of credit

6. EQUITY

\$1,500,000 investment Feb 1985

\$3,250,000 investment May 1986

\$2,500,000 investment December 1986

7. LEASES

Leases will be operating leases, with title to equipment held by leasing company. Lease payments treated as rent expense. There is no lease liability carried on the balance sheet.

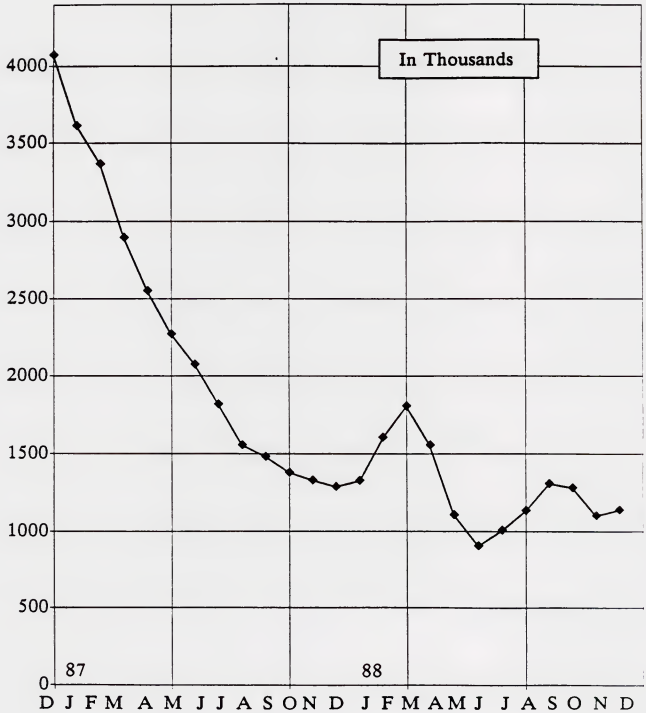
#scash.116
1-2-87

SYBASE CASH FLOW
1988

(S)

	1988 jan	feb	mar	apr	may	jne	jly	aug	sep	oct	nov	dec
beginning cash	1286817	1328079	1605503	1808044	1555041	1106243	907414	1009450	1135524	1307625	1281362	1101743
+ cash from operations												
contract sales	315250	551500	473957	373957	273857	534376	534376	534376	551043	501043	451043	807290
non-contract sales	695113	745946	797154	656992	698308	719777	1075603	1108151	1175446	1093191	1126289	1194663
interest	5893	6073	7353	8281	7122	5067	4156	4623	5201	5989	5869	5046
+ cash from other sources												
investors	0	0	0	0	0	0	0	0	0	0	0	0
lenders	0	0	0	0	0	0	0	0	0	0	0	0
total cash sources	1016255	1303519	1278464	1041230	979387	1259219	1614135	1647151	1731689	1600223	1563200	2007019
- cash uses												
COGS	78969	91140	93934	77118	78049	88009	123592	126846	134078	124350	126160	143687
capital expenditures	15000	15000	15000	16000	16000	16000	17000	17000	17000	18000	18000	18000
cash op exp. fixed	672480	893495	735525	855440	1015155	1015155	1032323	1032323	1063805	1128600	1241460	1391940
cash op exp. net 30	210045	224180	231165	245175	318480	338385	338385	344108	344108	354535	376200	413820
interest expense	300	300	300	500	500	500	800	800	800	1000	1000	1000
total cash uses	976794	1024095	1075924	1294233	1428184	1458049	1512099	1521076	1559588	1626485	1762820	1986447
ending cash, \$21m rev	1328079	1605503	1808044	1555041	1106243	907414	1009450	1135524	1307825	1281362	1101743	1140315

CASH BALANCE



CASH FLOW ASSUMPTIONS

1. CASH FROM SALES IS RECEIVED IN 75 DAYS
2. CASH FROM CONTRACTS IS RECEIVED NET 30 DAYS
3. INTEREST IS $.0055 \cdot \text{BEGINNING CASH}$
4. COGS IS 10% OF END-USER SALES + 3% OF CONTRACT SALES
5. CASH OP EXPENSES, FIXED ARE THOSE EXPENSES THAT OCCUR IN THE MONTH AND MUST BE PAID IN THAT MONTH, i.e. Salaries, Taxes, Rent.
6. CASH OP EXPENSES, NET 30, ARE THOSE EXPENSES FOR WHICH PAYMENT TERMS CAN BE NET 30, i.e. Supplies, Legal, Maintenance.

SYBASE, INC.
MARKETING PLAN

September 1986

SYBASE

MARKETING PLAN

"The development of complete products while driving them to commanding positions in defensible market segments."

William Davidow

- Positioning
- Pricing
- Distribution
- Support
- Promotion and Lead Generation

POSITIONING

- Positioning: What is it?
- The DBMS/4GL Market
- Sybase Positioning
- Sybase Differentiating Features
- Creating the Sybase Position
- Target Organizations and Applications
- Basic Sales Qualifiers
- Sybase Growth Projections
- Goal of Sybase Marketing Communications

POSITIONING

WHAT IS IT?

Definition

The segment of the market with which we are associated

Importance

Need to establish a leadership position in our segment to win

How

Find a hole and be the "Firstest with the Mostest"

DBMS/4GL MARKET

- Trends
- Market Projections
- Segmentation
- Competitive Segmentation

TRENDS

- DBMS
 - Rush to Relational
 - SQL Standard
 - DBMS merging with 4GL
 - Market ready to try SQL for "mission critical" applications
- Hardware
 - Commodities: Emerging major environments because of downsizing and line-extension
 - Distributed Environments (Mix & Match through networking)
 - Use of PC's and Workstations as terminals and application hosts
 - Software determines market segmentation

MARKET PROJECTIONS

DBMS/4GL - Independent Software Companies

	85	86	87	88	89	90
Total*	500M	650M	850M	1100M	1400M	1800M
Total RDBMS	100M	200M	400M	650M	900M	1200M

*IDC, April 86 (DBMS market only)

- 30% AGR
- Very slow growth in mainframes (because of DB2)
- Most growth in supermicros to superminis
- Most growth relational

SEGMENTATION

- By Computer
 - Major HW/OS environments
- By DBMS Technology
 - Relational vs Non-relational
- By Application Class
 - Decision Support vs On-line

MAJOR HW/OS ENVIRONMENTS

- 30XX/MVS
- 43XX/VM
- VAX/VMS
- All vendors/Unix
- PC/DOS
- 386/DOS 5.0 (anticipated)

DBMS TECHNOLOGY

- Non-relational - Performance
 - File access methods (e.g., VSAM)
 - Hierarchical (e.g., IMS)
 - Network (e.g., IDMS/R)
- Relational - Ease-of-use
 - SQL (e.g., Oracle)
 - QUEL (e.g., Ingres)

APPLICATION CLASSES

	Decision Support	On-line
Description	Inquiry, Analysis and "Lite" Applications	Transactional, "mission critical" Applications
Users	Small #/MIP Conversational End-user Tools	Large #/MIP Full Screen, Forms-based Application Development Tools
Applications	Ad Hoc and Slowly Evolving Retrieval Intensive	Planned and Quickly Evolving Update Intensive
DBMS	Smaller Databases Fast Response for Complex Retrievals	Larger Databases Fast Response and High Throughput for Complex Updates High Data Integrity High Data Security High Data Consistency High Operational Control High Availability

COMPETITIVE SEGMENTATION

	Decision Support	On-line
Relational	<p>MVS: DB2, Supra, Oracle</p> <p>VM: SQL/DS, Oracle, INGRES</p> <p>VAX: Oracle, INGRES, RDB</p> <p>Unix: Informix, Unify, INGRES</p> <p>DOS: Oracle</p> <p>5.0: ?</p>	<p>MVS: DB2</p> <p>VM: ?</p> <p>VAX: Sybase</p> <p>Unix: Sybase</p> <p>PC: ?</p> <p>5.0: ?</p> <p>Other: IDM, Tandem*, Stratus*</p>
Non-Relational	<p>MVS: Focus, Nomad, Adabase</p> <p>VM: Focus, Nomad, Adabase</p> <p>VAX: Datatrieve</p> <p>Unix: ?</p> <p>DOS: Focus, RBase</p> <p>5.0: ?</p>	<p>MVS: IMS, VSAM, IDMS/R, Ideal, TIS, 204</p> <p>VM: VSAM</p> <p>VAX: DBMS 32, RMS</p> <p>Unix: C-ISAM</p> <p>DOS: Dbase III</p> <p>5.0: ?</p> <p>Other: Tandem, Stratus</p>

* Relational DBMS not available yet.

COMPETITIVE HISTORY

	Average Pretax Profits	Revenues (FY, \$M)						Est 87	'86 Cum # of Direct Licenses*
		82	83	84	85	86	87		
Oracle	20%	3	5	13	23	56	100	2200	
Ingres	10%	1	3	8	18	29	45	1800	
Informix	20%	.6	2	5	10	20	40	?	
Unify	-	-	-	-	10	20	40	?	

*Supermicros or larger

COMPETITIVE POSITIONS

- Oracle
Portability, Compatibility, Connectability
- INGRES
The distributed SQL RDBMS
- Informix
The Unix RDBMS
- Unify
The Unix RDBMS

SYBASE POSITIONING

The High-Performance Relational DBMS

for

On-Line Applications

SYBASE DIFFERENTIATING FEATURES

- High-volume Performance
- DBMS Enforced Data Integrity, Security and Consistency
- Continuous Operational Control
- Distributed Database Management
- Intelligent Workstation-Oriented Application Tools

CREATING THE SYBASE POSITION

- Target Organizations and Applications
- Educate Press, Analysts, Prospects, Employees
- Strategic OEM, VAR, and Corporate Alliances
- Repositioning the Competition

TARGET ORGANIZATIONS and APPLICATIONS

- Government and Defense
 - Command and Control
 - Logistics
 - MIS
- Fortune 1000
 - Manufacturing
 - CIM (Shop Floor, Configuration Management)
 - Quality Control
 - Inventory (Just-in-time)
 - Distribution
 - Finance and Administration
 - Order Processing
 - Cash and Asset Management
 - Accounting
 - Treasury
 - Sales and Marketing
 - Telemarketing
 - Customer Support
- Banking and Finance
 - Loan Management
 - Cash Management
 - Portfolio Management
- Telecommunications
 - Inventory
 - On-line Customer Information
 - On-line Equipment Control

BASIC SALES QUALIFIERS

- Large Organizations
- Will buy VAX, Sun, etc.
- Right Applications (the more demanding, the better)
 - Users: > 10 concurrent users
 - Applications: > 20 retrieval transactions/second
> 1 update transactions/second
 - Database: > 300 megabytes
 - Expects application to grow
 - Needs/wants the Sybase differentiating features

SYBASE GROWTH PROJECTIONS

	85	86	87	88	89	90
Total Market	500M	650M	850M	1100M	1400M	1800M
Total RDBMS*	100M	200M	400M	650M	900M	1200M
Total RDBMS On-line*	-	10M	30M	80M	200M	300M
Sybase*	-	-	8M	20M	50M	90M

*Sybase estimates, September 1986

TARGET: > 30% SHARE OF MARKET

SYBASE POSITIONING GOAL

SEGMENT

Leader in High-Performance, On-line Relational DBMS

GOAL

Within One Year Have Analysts, Press, Customers,
Employees Repeating Our Positioning Statements



Hardware Vendors.

Some of the supermini vendors offer their own DBMS, and most offer one or more from a third party. The DEC VAX DBMS is a Codasyl-style database positioned to offer performance. This system requires great skill on the user's part to operate. It also requires the use of other DEC products that are not always well integrated. Furthermore, its performance is mediocre. These products represent competition primarily when a prospect is not going through a serious procurement but wants to stay with a particular hardware vendor. The DEC sales force are computer salesmen and do not understand DBMS products or how to sell them.

CONCLUSION

The relational DBMS industry is a stable and growing market. As computer processing continues to decentralize, there will be a growing need for flexible, easy to use systems which only relational provides. However, there is a growing need for relational DBMSs software that operates on general purpose hardware, provides high performance transaction processing in an on-line environment, and can address the growing need for networked and multi-user capabilities. The only existing systems which provide this capability require the use of special purpose hardware. Purchasers do not wish to buy special purpose hardware. Sybase's unique system architecture enables it to address this market niche.

BLI is the preeminent manufacturer of DBMS machines, with an installed base of over 500. A relatively expensive product, BLI sells primarily to the government and end users on the basis of very high performance. Its market is limited by its use of special purpose hardware. Purchasers are forced to buy a computer for which there is relatively little support from what is (in hardware terms) a very small vendor. It is difficult for BLI to adapt to changes in CPU and storage technology because they lack the resources of a major hardware vendor. As hardware evolves, it is much easier for a software vendor to take advantage of improved price performance ratios. For example when DEC introduced the VAX 8600 or the Micro VAX II, software DBMSs that ran on VAX 780's had a relative improvement at zero cost to the software vendor. BLI is further limited in that it only supplies third party front end tools.

Sybase products compete successfully with BLI in four ways. First, they perform as well as or better than comparable BLI products. Second, Sybase products run on standard hardware, which makes them less expensive and easier to maintain. Third, Sybase supplies its own extremely functional front end tools. Fourth, Sybase provides many operational features that users need, but can't get from BLI.

Software DBMS.

There are two main software companies in the relational DBMS marketplace. Oracle Systems Corp. and Relational Technology, Inc. While not requiring custom hardware, these products are much slower than BLI, and cannot support many users. In addition, they are older products dating from the late 1970's and do not reflect many of the advances in recent relational technology. For example, neither system provides triggers to maintain the integrity of the database, which is essential in a distributed environment. Their major advantage is the market momentum that they both have. However, Sybase will have an advantage in the evolving market because of its faster speed, better application tools, better operational features, and orientation to a distributed environment.

There are second tier DBMS software vendors, such as Informix Systems Corporation, and Unify Corporation. These companies have developed products that handle small applications, and are only now entering the market for large scale applications. Their focus has been on the Unix supermicro market, where applications tend to be small. They lack the speed and the operational tools necessary to handle serious applications. Neither organization has a significant end-user sales operation, which will limit their ability to enter the supermini and mainframe markets.

has an optimized self-contained operating system which enables it to perform data management functions efficiently.

The requester/server architecture allows the database to be accessed by any combination of computers, workstations or PCs. This increases the data integrity requirements, which Sybase solves via the data server as opposed to the user interface.

The design of the Sybase datasever, gives it the power to support many users without performance degradation and the speed to handle large files. Sybase has also developed an algorithm which allows it to perform database utilities such as backup, restore and file change without cutting off users. This algorithm gives Sybase true on-line capabilities.

Sybase has developed a proprietary way of handling Standard Query Language (SQL) statements. Traditional database design is to handle SQL commands by first breaking them up into component parts, interpreting the parts to determine what needs to be done, figuring out the best way to do it, then doing it. This must be done each time the command is executed, since the database format may have changed since the command was stored. In the Sybase system, SQL commands are stored in a compiled state - all the breaking up, interpreting, figuring work is pre-compiled. When the command is executed, the system determines if anything has changed to make re-compiling necessary. If not (and generally re-compiling is not needed) time is saved. This feature dramatically increases the speed of the Sybase product.

COMPETITION

Sybase faces three main sources of competition: database machine companies, other software vendors, and hardware vendors. Below is a detailed summary of each category.

Database Machines

One of the most important selection criteria for a DBMS is performance. Almost all major procurements require a demonstration of speed, sometimes against a standardized benchmark. The slow performance of software-based relational DBMSs led to the development of custom hardware designed to meet demands for high speed. There are two main DBMS machine companies: Teradata and Britton Lee, Inc. (BLI). Both companies base their computers on standard microprocessors. Teradata uses the Intel 8086, and Britton Lee the Zilog Z8000. Teradata is very expensive (in excess of \$250,000 for a basic machine) and is focused on the IBM marketplace. Its total installed base is fewer than 50 machines.

RELATIONAL DBMS TECHNOLOGY

A relational database system consists of a user interface (entry screen, menus and report definition), a database engine which performs updates, queries, search and sort operations, and a processor. The factor which determines the performance of relational DBMS software is architecture. System architecture affects the number of database users, response time, data integrity, allocation of computer resources and the distribution of workload between computers.

In most relational DBMS, both the user interface and the data management functions operate as a single process. The single process system has a number of drawbacks. First, it calls upon the computer's multi-purpose operating system (like Unix or VMS) to execute read and write commands to the database, and perform the management tasks of allowing multiple users to access the database. A multi-purpose operating system is inherently slow at processing execution commands because it is not optimized for data management functions. Second, single process architecture limits the number of users because each user requires a large percentage of the computer's memory. It also means that the computing power of PCs and workstations are not used because they operate merely as terminals talking to programs operating in the user areas of a central computer.

A less common architecture removes operating system limitations by using a special purpose computer which runs only the query, update and sorting chores. This is called a requester/server architecture, since the database machine simply waits for requests from user interface programs and services them. The advantage of this architecture is that database machines are able to run on-line applications while maintaining relational capabilities. The major problem with this approach is that it requires specialized hardware, which is expensive, difficult to maintain and impossible to upgrade.

SYBASE TECHNOLOGY

Sybase employs a requester/server architecture which operates on general purpose hardware. To avoid the operating system overhead, it uses a "multi-threaded design" to query, update and sort in a single user area. This means that the amount of memory needed for each user is drastically reduced, allowing a greater number of users. Since this approach handles multiple users' requests simultaneously, degradation of performance with each additional user is small. In addition, the multi-threaded architecture

overcame the primary shortcomings of hierarchical architecture: inflexibility and difficulty of use. However, because relational database structure is far more complex, they have traditionally been incapable of searching and sorting large files quickly.

The emergence of high-performance low-cost super minicomputers brought computing power out of the data processing department and directly into the hands of the user. The decentralization of computing power pushed the growth of relational DBMS by creating the need for DBMSs that were flexible and easy to use by the end user.

System Applications

There are two primary application segments of the DBMS market. The first is the on-line segment which requires large databases that can quickly process queries and updates. This segment is still dominated by hierarchical databases. The other segment is the decision support segment. This segment is characterized by decentralized data processing and few users performing data analysis (as opposed to data updates) in non critical applications. This market segment relies solely on relational DBMSs because of flexibility and ease of use. There is a huge gap in the middle of the market, i.e., applications that seek decentralized computer processing, flexible, and user friendly programs, large database capability and multi-user capability but demand high performance, high response time tools.

MARKET OUTLOOK

The decentralization of data processing is continuing at an accelerating rate. Relational databases are widely accepted as the database structure of the future. However, what the market needs is a relational DBMS that overcomes the performance drawback, of existing relational products, i.e. can operate in a networked environment, accommodate many users at a high rate of speed.

SYBASE TARGET MARKET

Sybase has developed the first high performance on-line relational DBMS software that operates in a multi-user environment and on general purpose hardware. It will target those market segments that require on-line critical transaction processing, have multiple users, and desire user friendly flexible DBMSs.

INDUSTRY OVERVIEW

MARKET DESCRIPTION

Sybase competes in the relational database management system (DBMS) segment of the DBMS market. In 1986, relational DBMS sales were \$200 million and are projected to grow to \$1.2 billion by 1990.

DBMSs are the most important tools used in business today. They are the vehicles by which businesses manage information. DBMS applications range in complexity. At the high end of the market, DBMSs need to operate very fast, manage vast amounts of data, and be accessible around the clock to many users doing a high volume of updates. Examples of these applications are airline reservation systems, automatic tellers and Comdisco's "Command" Portfolio Management System. At the lower end of the market, DBMS are used in smaller environments with fewer users who primarily use the database to analyze information. An example of this would be Comdisco's Venture Lease Group maintaining a company profile database using Lotus 1-2-3 on a personal computer. A DBMS has two components: software, which has the code to execute the program, and a processor which powers the program.

MARKET SEGMENTS

The market for databases are segmented by the architecture of the database and the user application.

System Architecture

There are two types of DBMS architecture: hierarchical and relational. Hierarchical DBMSs were developed first and were popular in the early 1970's when information processing was centralized on large mainframes within the domain of the data processing department. Hierarchical DBMSs are capable of storing large amounts data and searching and updating information very quickly. However, they are inflexible and difficult to use. Access to data (querying or updating) is limited and requires a programmer to write specific commands. The type of information stored must be static because reconfiguring the data file for additional information requires a complete reconfiguration of the database. Reports are limited.

Relational DBMSs were developed in the late 1970's. Relational DBMSs structure data in the form of a grid, with no rigid rules defining the relationship between data files. This makes it easier to access data and, more importantly, easier to rearrange the data relationships. Relational DBMS

SYBASE EQUIPMENT ANALYSIS

Equipment Description

Sybase has approached Comdisco for a \$1 million lease line for DEC Vax, DEC Microvax, Sun 3, peripherals associated with those systems and office furniture. Although not yet confirmed, the planned delivery date of the equipment ranges from the third quarter of 1987 through the second quarter of 1988.

Residual and Liquidation Values (Exhibit I)

Karen Johns from our trade center has provided residuals for the equipment listed in Exhibit I, assuming that all of the equipment is placed in service during the fourth calendar quarter of 1987. Except for the office furniture, the fair market value residuals are based on Comdisco's payout guidelines assuming that the residual is equal to one minus our current payouts (i.e., the amount of residual risk CDO would assume on the equipment when writing a guideline lease for terms of one, two and three years). Details of the type of office furniture Sybase intends to lease were not available at the time of this writing; accordingly, conservative residual estimates had to be established (Rick Finocchi and Jim Labe were consulted on this and agreed to the estimates). The exhibit also provides liquidation values which are estimates of the equipment value should it have to be disposed of "quickly". These are considered conservative values and should be used only as a worst case scenario.

The weighted average residuals at the end of the lease are estimated to be 17.56% (FMV) and 7.56% (liquidation value). The present values of these residuals at a 10% discount rate are 13.19% and 5.68% respectively.

RECOMMENDATION

Strengths

- + Sybase's product is the first of the next generation of DBMSs. The product has been successfully beta tested and debugged. The company has a two year lead time over its competition.
- + Sales to end users are exceeding projections. The company has OEM and VAR contracts with significant companies which will lead to substantial future revenue from markets it would otherwise be unable to serve.
- + Software is a very high margin business with virtually no direct ongoing manufacturing costs.
- + The company is well capitalized and has operating cash that will last eight months at no sales; August sales were \$750,000.
- + The markets for relational DBMSs are substantial and growing. Sybase's two primary competitors doubled in size last year.
- + The company's technical team is excellent and its marketing and sales teams are strong.
- + The venture capital behind Sybase is exceptional and includes Apple Computer.

Weaknesses

- The company's President has no prior executive experience and its Vice President-Finance has no prior finance experience.

Risks

- ? Sybase's competitors may develop a comparable product before it obtains a significant share of the relational DBMS market. The market may not differentiate Sybase from its competitors.

Recommendation

In my judgement, Sybase has the ingredients to become a significant player, if not the market leader, in a high growth industry where companies are valued at significant premiums and trade on the open market at P/E multiples of 40+. Sybase will have sufficient resources to meet its lease obligations and our warrants will have substantial value. Therefore I recommend that the Venture Lease Committee approve the transaction as proposed.

Resume Brief

MARK B. HOFFMAN

President and Co-Founder

- 1984 MARK B. HOFFMAN, CONSULTING
System design and database
management
- 1980 - 1984 BRITTON-LEE INC.
Vice President of Operations
Acting Vice President of Engineering
General Manager Technical Services Group
Director of Materials
- 1979 - 1980 AMDAHL CORPORATION
Manufacturing Management Associate
Test Support and Quality Assurance
Senior Buyer
Senior Production Control Planner
- 1976 - 1978 PRECISION TOYOTA-TUCSON, ARIZONA
New and Used Car sales
- 1969 - 1975 UNITED STATES ARMY, Captain
Logistics Officer
Company Commander (Korea)
Plans and Operations Officer

EDUCATION

University of Arizona: M.B.A., Finance - 1979
United States Military Academy: B.S., General Engineering -
1969

CONCLUSION

Mark Hoffman is not an experienced Chief Executive Officer. His background is in operations and he has therefore not been exposed to finance, sales nor marketing. The investors were concerned about him early-on but have been impressed with his performance. Nonetheless, the investors are prepared to act quickly if Mark falters.

Mark's references describe him as an outstanding operations person, a good planner, organized, poised and thorough. He is considered a perfect complement for Bob Epstein. Together, Mark and Bob make a good executive team.

lcs:RB1.SYB

Resume Brief

ROBERT S. EPSTEIN Ph.D.

Executive Vice President and Co-Founder

- 1984 ROBERT EPSTEIN, CONSULTING
System design and database management
- 1979 - 1984 BRITTON-LEE INC.
Vice President Product Development
Director Software Development
- 1976 - 1979 UNIVERSITY OF CALIFORNIA AT BERKELEY
Chief Programmer for Ingres RDBMS project
Teaching Associate
- 1974 - 1976 PACIFIC GAS AND ELECTRIC
Software Engineer

EDUCATION

University of California at Berkeley:

- 1976 - 1980 Ph.D. in Electrical Engineering and Computer
Science
- 1974 - 1976 M.S. in Electrical Engineering and Computer
Science
- 1970 - 1974 B.S. in Electrical Engineering and Computer
Science

CONCLUSION

Bob Epstein is considered an industry visionary and the key to Sybase. His references describe him as "a god", "the smartest RDBMS person on the planet", and "having the vision, technical competence, and inspirational abilities of Stephen Jobs". He has a Ph.D., M.S. and B.S. in Electrical Engineering and Computer Sciences. While in his Ph.D. program at Berkeley, he helped pioneer the relational database management system concept as Project Manager of the Ingres project. The Ingres project developed the Ingres RDBMS sold today by Relational Technology. Thereafter, he designed the original Britton Lee database machine.

Bob is extremely well known and respected within the industry. He is an outstanding salesman and has successfully negotiated numerous product development contracts with OEMS and VARs for Sybase.

Resume Brief

STEWART A. SCHUSTER

Vice President Marketing

1986 RELATIONAL TECHNOLOGY, INC.
Vice President, Business Development

1985 PANORAMIC, INC.
Vice President, Technology

1983 - 1984 RELATIONAL TECHNOLOGY, INC
Director of Marketing
Product Marketing Manager

1978 - 1983 TANDEM COMPUTERS, INC.
Branch Sales Manager
Regional Systems Manager
Software Designer, Data Bases
Development

1977 - 1978 INTEL CORPORATION
Senior Staff Engineer, Commercial
Systems Division

1973 - 1977 UNIVERSITY OF TORONTO
Associate Professor

1967 - 1973 UNIVERSITY OF ILLINOIS
Programmer

EDUCATION

University of Illinois: Ph.D., Computer Science
M.S., Applied Statistics

Washington University: B.S., Applied Mathematics and
Computer Science

CONCLUSION

Stewart is credited with the product positioning and the extensive publicity received by Sybase. He has extensive knowledge of the market, the customers needs and the product. Stewart has tremendous technical insight while having the ability to clearly communicate his message. The investors are very satisfied with his performance. His references describe him as a very bright marketing person.

Resume Brief

PETER C. MORK

Vice President Sales

1985 - 1987

RICOH SYSTEMS, INC.
Vice President, Marketing and Sales

1984 - 1985

COUNTERPOINT COMPUTERS
Vice President, Marketing

1972 - 1984

DATA GENERAL CORPORATION
Director, Marketing, Desktop Division
Director, Japanese Business Development
Sales Manager

CONCLUSION

Peter has had successful track records at Data General and Ricoh. While at Data General he developed a reputation as a developer of quality sales people. His references feel he is very qualified to build a sales organization. The investors are very pleased with his performance. Thus far, he has met his projections.

Resume Brief

DAVID M. TURNER

Vice President of Finance and Operations

1980 - 1985 BRITTON-LEE INC.
Director of Materials
Production Control Manager

1979 - 1980 AMDAHL CORPORATION
Manufacturing Management Associate

EDUCATION

University of Santa Clara: M.B.A., Finance - 1979

San Francisco State University: B.A.,
Industrial/Organizational Psychology - 1976

CONCLUSION

David Turner is very inexperienced and, prior to joining Sybase, had no experience in finance. The investors are acutely aware of Turner's inexperience and are watching him closely. To date, he has adequately responded to the challenges of the position. Nonetheless, the Board will most likely hire a seasoned CFO sometime next year, prior to launching an IPO drive.

David is described as thorough, hard working and attentive to detail. He is not a flashy CFO type but more of a low key controller. He has been through three rounds of equity financing, negotiated two equipment lease financings and a building lease.

SYBASE, INC.

Management Interview Notes

Date Interviewed: August 17, 1987

Person Interviewed: Robert Epstein, Ph.D.
Executive Vice President and
Co-founder

Firm: Sybase

Present: Bill Tenneson
Rick Stubblefield
Karl Mosgofian

How difficult is it to port the DataServer and DataToolset products to other hardware?

The DataToolset would take about three days. The only other DataServer port we will do is to the IBM VM environment. The technical aspect is not a problem, but the cost is estimated at \$2.5 million of which \$800,000 is actual engineering costs. The remaining is testing, maintenance and staffing. We are looking for either a customer or OEM to fund the cost.

What types of users are you selling to now and what is the sales leadtime?

Current sales are to customers with existing database applications who are frustrated with their Oracle or Ingres product. The sales cycle is taking five to six months, and includes a thirty-day trial period.

How difficult is it for a customer to convert its existing DBMS to Sybase?

Our data server has been designed to accept the data format used in other DBMSs. In that situation, no conversion is necessary.

How does using another data format effect performance?

Speed is reduced by 50%. Our hope is that our format will become standard so that competitors will have to make products compatible with ours. However, we may at some time have to create some conversion utilities.

What is your agreement with Microsoft?

We are porting our data server and data library to the OS/2 operating system. Microsoft is creating its own front-end.

The data server will be Microsoft's high end, multi-user/network database system. Microsoft is funding the product port. Microsoft does not have a database product but would very much like one. Sybase will receive royalties on all sales by Microsoft.

Will your name be on the product?

It will appear on the copyright screen. We will also be selling our DataToolset under our own name.

Will you market the OS/2 version?

Yes, to Fortune 1000 companies. We feel that we can sell to that market better than Microsoft.

How does Sybase compare with your competitors?

Our performance, data integrity and front-end tools are all better than the competition. Britton Lee is expensive, requires specialized hardware, and can't match our performance. Oracle and Ingres are both much slower than Sybase, have many technical problems that frustrate users, and are only capable of handling decision support applications. They cannot handle large, on-line databases, both because of their performance and lack of features.

What is to prevent your well capitalized competitors like Oracle from designing a similar product?

I like to use a company's track record as an indicator of its future. IBM will never connect to a wide range of equipment. Its products do not work on DEC machines. BLI has committed to an approach which can never work because no one wants special purpose hardware. Oracle's product is positioned to run on any machine, which limits its redesign capabilities. It also must stay compatible with a large installed base, which prevents the kind of major rewrite needed to design a similar product. RTI (Ingres) has a history of keeping its software simple, and has no cash to put into R&D. In order for these companies to design a similar product they would need to start all over and redesign their system architecture. This will take a minimum of two years.

Sybase had a product development setback earlier this year, please describe.

The problem was bugs in the DataServer which had not appeared earlier because the system was being used by less sophisticated users. This set us back about three months.

Why do you feel Sybase has better addressed the needs of the market than its competitors?

I was the chief architect of the Ingres Relational project at U.C. Berkeley in 1978. I was also the chief architect of the Britton Lee System. I have built two systems from the ground up in the past. Through these experiences, I have learned from the architectural mistakes that were made in building those systems. At Sybase, we had the opportunity to start from scratch and redesign the system for speed. In addition, we've taken special care to ensure the system has features users want. For the competition to match our program, they would need to totally redesign their system. They can't do this because they have too large of an installed base that they have to maintain. Even if they did, it would take them two years to complete.

SYBASE, INC.

Management Interview Notes

Date Interviewed: August 17, 1987

Person Interviewed: Tom Haggin
Front-End Development Manager

Firm: Sybase

Present: Bill Tenneson
Rick Stubblefield
Karl Mosgofian

What have you done in SyBase which makes it benchmark so much faster than other relational database managers?

Sybase was designed to be an on-line RDBMS system. To be on-line it had to overcome the performance shortcomings of a relational data base. We began by seperating the front and back end applications. This is called requestor/server architecture. This enables us to use a data requestor process called multi-threaded. The data server in a multi-threaded design does all the multi-user job scheduling, task switching, processing and locking. The data server has been optimized to do these tasks efficiently. In a conventional setup, the computer's operating system does all of the jobs. An operating system is general purpose and not optimized to handle these tasks. This architecture also enables the operating system overhead to be eliminated thereby using less overall memory and enabling more users to access the data base at virtually no additional memory allocation. This is the key to a multi-user environment and distributed databases.

The other key performance advantage comes from the use of stored procedures. Procedures are the commands which read and write data to the databases.

Many transactions are predictable and routine, where, once defined, can be used in a streamline process that eliminates many interpretation steps. Sybase uses this technique.

Why do you feel Sybase will be the premier RDBMS?

This is the third database system we have designed. We made our mistakes at Britton-Lee, and knew going into this project what not to do.

What are record locking functions?

Locking functions prevent more than one user from trying to update a record at the same time. Normally the operating system keeps track of what records are currently in use. By doing it within the data server we may save only milliseconds on each disk operation, but our system is so fast that those milliseconds add up. Bob Epstein is a performance fanatic, and there are many such refinements throughout the system.

Since SyBase takes over multi-user functions from the computers operating system, does it interfere with other programs running under the operating system?

No, because it's self contained. To the operating system, it looks like a single job running. Memory is allocated when the data server is first started. That is the only memory used, so there is no interference with other areas of memory.

Is there anything about the way you are storing data which effects performance?

We use a standard B-Tree technique which is not unique. However we have added an ability to use the technique more effectively by storing data more efficiently within the B-Tree system.

What facilities are available for customizing the user interface and performing processing functions?

For custom screens, there are program "hooks" at the screen, field or field group level. This means that at any point in a screen a user program may be called to do whatever special purpose processing needs to be done. For other needs such as special reports or period processing, programs may call on the DB-Library interface, which allows full access to the data server. These programs would be written in C or Cobol, or, for the VMS environment Fortran.

What kind of support are you offering to the people who will be doing this kind of application development work?

Currently we have classes in SQL reporting, Data Workbench screen and menu setup, and a class for programmers on the DB-Library interface. The classes have been well received, and in fact we need to add classes because they are oversubscribed.

Could you explain how a distributed database system works?

Currently a SyBase user can access any file on the Data Server, and the files within the data server may be related to one another. In a distributed data base, a user can access files on any one of many Data Servers linked together. These could be located all over the country. This is transparent, so that the user does not know where the data actually resides.

How far are you from having distributed capabilities in SyBase?

Release 3, which should be completed in the 4th quarter of 1987, will be a distributed database. Most of the important design features which allow SyBase to be a distributed system exist. The starting point for a distributed database system is server/requestor architecture. Multi-threaded requestor process is also necessary. Data integrity also needs to be done on the data server.

SYBASE, INC.

Personal Reference Interview

MARK HOFFMAN

President, Chief Executive Officer and Co-Founder

Date of Interview: August 26, 1987
Person Interviewed: Kwang-I Yu
Title: Chief Scientist
Firm: TRW
Phone Number: (213) 535-4910
Interviewed By: Rick Stubblefield

How do you know Mark Hoffman?

I met Mark through Bob Epstein. As you may know, TRW is a major backer of Sybase. I was the person initially approached by Bob and Mark for financial backing of Sybase.

What is your opinion of Mark Hoffman?

Mark is a very level-headed, honest, fair, likeable and personable individual. I enjoy working with him. In all of our negotiations, he's been very professional. However, I don't know Mark that well.

What are Mark's strengths?

I don't know Mark's individual strengths. However, I feel Bob and Mark, together form a very strong team. Bob Epstein is very innovative and aggressive. In negotiating, Bob would stake out his position and risk his neck and fortune to achieve his position. Mark is an accomplished negotiator and seeks compromise and attempts to find other perspectives to solve a problem. He is very relaxed and poised individually. I feel he and Bob work together as a team without friction.

What is your opinion of Mark's leadership abilities?

I really only know Mark through negotiations. Based on what I have seen, he is a very effective negotiator and has the

ability to persuade individuals to his point of view. Once again, very level-headed and poised.

What are Mark's qualifications as Chief Executive Officer?

I don't really know. However, TRW has negotiated a significant product development contract with Sybase. Based on what I've seen, I'm very impressed with Sybase's operations and the loyalty of their people to top management.

What are Mark's weaknesses?

I don't know. All my dealings with him were very formal. I can say he's not the technical brains behind the organization. However, he is the most level-headed in the organization, and appears to be steering the company on a smooth path.

SYBASE, INC.

Personal Reference Interview

MARK HOFFMAN
President, Chief Executive Officer and Co-Founder

Date of Interview: August 26, 1987
Person Interviewed: Charles Irby
Title: Vice President, Engineering
Firm: Metaphor
Phone Number: (415) 961-3600
Interviewed By: Rick Stubblefield

How do you know Mark Hoffman?

I new Mark when he was back at Britton Lee and worked with him for several years then. Also, while at Sybase, I've been very involved with him on the negotiation of the Metaphor contract.

What is your opinion of him?

Mark's a real honest, level headed guy. I'm very impressed with his negotiating capability and his judgement.

Does Mark have prior executive responsibilities or experience?

Most definitely. While at Britton Lee, Mark was in charge of operations. His background is day-to-day operations and day-to-day decision making, keeping a company running. His background is not a technical one, although he has technical insite.

How would you describe Mark's leadership abilities?

I feel Mark's a strong leader. He has excellent people skills, is a very good manager, organizer and planner. In my dealings with him, I've been impressed with his leadership ability.

What are Mark's weaknesses?

I can't think of any off hand, but if I had to say something it would be that he has never gone through the process of growing a small company into a substantial company. I suspect he will make mistakes, but Mark is a very savvy character and I expect he'll learn from his mistakes and not make any fatal ones.

Do you know of any significant accomplishments of Mark Hoffman's in the past?

Metaphor has worked closely with Britton Lee over the years. Through that relationship I know that BLI was dealt a major blow when Mark left. The company was very concerned about replacing him.

SYBASE, INC.

Personal Reference Interview

ROBERT EPSTEIN
Executive Vice President, Co-Founder

Date of Interview: August 26, 1987
Person Interviewed: Kwang-I Yu
Title: Chief Scientist
Firm: TRW
Phone Number: (213) 535-4910
Interviewed By: Rick Stubblefield

How do you know Robert Epstein?

Bob was the person who initially approached me in an attempt to raise venture financing from TRW. Bob is a very good salesman. TRW is a major investor in Sybase and has also negotiated major product development contracts with Sybase. Prior to that, Bob was a personal consultant to me on database product development at TRW.

What is your opinion of Bob's technical competence?

With regard to relational databases, Bob is perhaps the smartest individual on the planet. He has extensive background working with relational databases. He was the chief architect of the Ingres project while at U.C. Berkeley. In addition, he was the driving force behind Britton Lee's relational database. Bob has had the opportunity to learn from his mistakes while at Britton Lee and Ingres. At Sybase, he has designed and developed a database manager that is far superior to any products on the market today.

What is your opinion of Bob's business skills?

Bob has tremendous business sense. He is a very shrewd businessman and very persuasive. The reason TRW elected to back him is because we feel he is a person of very high integrity. On many occasions he gave his personal promise

and lived up to the promise regardless of a detriment to his personal benefit. I'm not just speaking personally about Bob, but on the way TRW senior management feels about him as well.

What is your opinion of Bob's leadership abilities?

Based on the results I have seen, I think they are outstanding. My group and his group work together often. I'm very impressed by his ability to inspire strong loyalties from his people. I feel this characteristic of his is very similar to Steven Jobs, co-founder of Apple Computer. Both individuals seem to have a keen ability to inspire loyalty, dedication and admiration from their key technical people. I have worked closely with many of their technical people and they are truly top flight individuals. It is rare that you see the type of loyalties Bob has. If I founded a company today, I would want Bob as part of my team. In my opinion he is a model individual.

What are Bob's weaknesses?

I am not a good person to ask because I'm very fond of him. I'm not objective enough. However, if I had to single out any one thing, it would be that at times he is impatient with large bureaucracies. However, that is why I feel Mark and Bob make such a strong team. Bob is very level headed, poised and relaxed. They truly compliment one another.

SYBASE, INC.

Personal Reference Interview

DAVID TURNER
Vice President, Finance and Operations

Date of Interview: August 25, 1987
Person Interviewed: Don Campbell
Title: President
Firm: Sequoia Capital
Phone Number: (408) 475-8595
Interviewed By: Rick Stubblefield

Background comments:

Sequoia Capital is the venture leasing arm of the Hambrecht & Quist Group. Sequoia Capital has \$2.5 million worth of capital equipment on lease to Sybase. Don knows David Turner through his dealings with Sybase.

How competent is David as a Chief Financial Officer?

I can't comment on that because I've never seen David operate as a CFO. I can say that his work is very complete, thorough and timely. I know Hambrecht & Quist has been very pleased with the whole management team at Sybase.

How do you feel about your investment in Sybase?

We are very excited, as are all the other investors. Sybase has a very nice product, has a very competent management team. It is very well capitalized and very well thought of in the venture community. I don't think companies come any better than Sybase. The reason we did not compete on the most recent equipment lease financing opportunity is that we had reached our upper limits on exposure to any one company. We also felt that we would be unable to meet Sybase's ongoing equipment financing needs. As such, we recommended it look to third parties to arrange equipment lease financing. However, to demonstrate our commitment to the company, we have just entered into an accounts receivable financing package with Sybase. If you decide you get cold feet on the investment opportunity with Sybase, let me know because I have plenty of people that would like the opportunity to invest in the company.

What do you feel is the biggest obstacle ahead of Sybase?

The biggest obstacle is clearly its ability to penetrate the market. It's a competitive risk. On the other hand, I don't often see companies that are better positioned than Sybase to successfully succeed.

SYBASE, INC.

Personal Reference Interview

DAVID TURNER

Vice President, Finance and Operations

Date of Interview: August 27, 1987
Person Interviewed: Peter Pervere
Title: Audit Manager
Firm: Arthur Young
Phone Number: (415) 951-3215
Interviewed By: Rick Stubblefield

How do you know David Turner?

I have been the audit manager on the Sybase account since December, 1984. David joined the firm in late spring, early summer of 1985. David's prior experience was at BLI where he worked with the Sybase's founders.

Is David an experienced financial officer?

No, he's not. He does not have any extensive financial background or experience. However, to date, he has been very effective at doing the job. He's been through three rounds of venture financing, an equipment lease financing contract and he has negotiated a building lease contract. In my opinion he's progressing, learning the ropes and to date has been able to meet the challenges that have been thrown at him.

What are David's strengths?

David is very thorough, hardworking, attentive to detail. He's done a competent job. He recognizes his weaknesses, and is not afraid to use his resources. He relies on us often to help him solve issues.

What is David's management style like?

That's harder for me to address because I don't see him in day-to-day operations. However, he seems to have delegated effectively to his subordinates.

What are David's weaknesses?

Aside from his lack of experience, I can't think of any. To date, he's been very thorough, as I said, and hardworking. The Board asks me at every meeting my opinion of Dave and how he's progressing. I tell them that I think he's meeting the challenges effectively.

Does David have the support of Senior Management?

Hoffman and Epstein hired him away from Britton Lee. I know Mark supports him quite well and provides direction on issues that he doesn't understand. I think there is some concern on both the Board's behalf and senior management's behalf that as this company grows to be more significant whether he'll be able to handle the challenge. I can tell you though that the Board is keeping a close eye on David.

What is your opinion of the operational management of the company?

So far the company has made all the right moves. They missed a deadline in early spring that set them back about three months. But Mark Hoffman provides some great operational direction. He's done an effective job.

What is your opinion of the overall management team?

Bob Epstein is a technical genius. But I also feel he has a good understanding of how to run a company and how to motivate people. Mark Hoffman seems to be leading the company down the right path.

Sybase has entered into several product development contracts with outside entities. How are these accounted for?

The outside companies, like Metaphor or Microsoft, entered into contracts with Sybase whereby Sybase must meet certain product development benchmarks. These companies provide the money for product development. The money's received from these third party companies is accounted for as revenue by Sybase over time, and they are recognized in proportion to achieved benchmarks. The company does not make a significant amount of money from these contracts. The contracts are with hardware vendors. These vendors want the Sybase product "ported", as we say in the industry, to their hardware. Porting refers to the ability to make the software run on the vendor's operating system. These contracts are significant. Without them, Sybase would have to internally fund these ports. The companies that fund the product port get licensing rights. Sybase will get royalties from the eventual sale of the product.

How does the company account for its software development expenses?

There are pretty strict accounting regulations concerning the accounting for software development expenses. All expenses must be expensed until a company reaches a point that's called "technological feasibility". Generally technological feasibility is that point in time where there is certainty that the future product works. Once this point is reached, software costs are capitalized and thereafter amortized against income over the future life of the software product. Industry standard is a three to five year amortizable life. Sybase is using three years. Sybase began capitalizing costs in July of 1987.

What is your opinion of Sybase?

I've been with them since inception and I feel they have a significant product and a significant opportunity. I've dealt with many start-ups and I think Sybase is positioned to do quite well.

SYBASE, INC.

Personal Reference Interview

PETER MORK
Vice President

Date of Interview: August 26, 1987 .
Person Interviewed: Bill Adams
Title: Vice President Sales
Firm: Pixar
Interviewed By: Rick Stubblefield

How do you know Peter Mork?

We met back in 1973 when we both worked for Data General. For a while we were peers as district managers, then I was promoted and became his boss. He was responsible for four people and generated \$28 million in revenues.

Was he highly thought of at Data General?

Data General was one of the fastest growing companies back in the mid-70's. Its annual growth rate exceeded 50%. At that time Data General was the industry sales training ground. We were net exporters of managers. Peter was a significant contributor. He grew his own sales managers and had a reputation for developing his people.

Does he have experience building a sales organization?

At Data General he built a very good team under him. He has the ability to hire good people. I feel he is more than capable of building the sales organization at Sybase.

What are Peter's weaknesses?

He is more tolerant of people than I am.

Can you think of a situation where Peter has failed?

His job at Counter Point didn't work out. He had a problem with his female boss and he only stayed there a year. However, this woman had a history of people problems.

What is your opinion of Peter?

Peter is a very good person and I think can handle the job just fine.

EXHIBIT VI

SYBASE, INC.

BALANCE SHEET PROJECTIONS

(in thousands)

(fye: 12/31)

Assets:	1987	1988	1989	1990	1991
Cash & Equivalents	\$3,455	\$5,594	\$9,420	\$16,759	\$29,112
Receivables	\$1,808	\$5,888	\$8,300	\$13,680	\$22,560
Pre-Paids	\$190	\$300	\$0	\$0	\$0
Total Current Assets	\$5,453	\$11,782	\$17,720	\$30,439	\$51,672
Property Plant & Equipment	\$475	\$575	\$590	\$830	\$1,190
Depreciation	\$95	\$204	\$200	\$398	\$796
Net Property Plant & Equipment	\$380	\$371	\$390	\$432	\$394
Other Long Term Assets	\$220	\$250	\$0	\$0	\$0
Total Assets	\$6,052	\$12,402	\$18,110	\$30,871	\$52,066
=====					
Liabilities:					
Bank Borrowings	\$885	\$2,885	\$1,328	\$2,189	\$3,610
Current Leases	\$0	\$0	\$0	\$0	\$0
Accounts Payable	\$203	\$330	\$588	\$955	\$1,578
Other Current Liabilities	\$500	\$300	\$0	\$0	\$0
Total Current Liabilities	\$1,588	\$3,515	\$1,916	\$3,144	\$5,187
Long Term Debt	\$82	\$67	\$0	\$0	\$0
Total Liabilities	\$1,671	\$3,582	\$1,916	\$3,144	\$5,187
Shareholder's Equity:					
Preferred Stock	\$10,516	\$10,516	\$10,516	\$10,516	\$10,516
Common Stock	\$245	\$374	\$522	\$565	\$807
Stockholder Notes Receivable	(\$175)	(\$284)	(\$253)	(\$290)	(\$326)
Add'l Paid In Capital, Warrants	\$4	\$4	\$4	\$4	\$4
Retained Earnings (Prior)	(\$2,994)	(\$6,209)	(\$1,790)	\$5,405	\$16,931
Retained Earnings (Current)	(\$3,215)	\$4,419	\$7,195	\$11,526	\$18,946
Total Stockholder's Equity	\$4,382	\$8,820	\$16,194	\$27,727	\$46,879
Total Liabilities & Shareholder's Equity	\$6,052	\$12,402	\$18,110	\$30,871	\$52,066
=====					

EXHIBIT V

SYBASE, INC.

AUDITED BALANCE SHEETS

ASSETS	From Audited Financials		
	1984	1985	1986
Current Assets:			
Cash and Short Term Investments	\$38,206	\$963,000	\$4,003,000
Contracts Receivable	---	\$250,000	\$25,000
Accounts Receivable	---	---	\$171,000
Other Receivables	---	\$54,578	\$129,000
Other Current Assets	---	\$10,014	\$100,000
Total Current Assets	\$38,206	\$1,277,592	\$4,428,000
Restricted Cash Note	---	\$100,000	\$100,000
Equipment and Improvements:			
Computer Equipment	\$69,015	\$15,703	\$100,000
Furniture and Fixtures	\$9,977	\$5,806	\$44,000
Leasehold Improvements	---	\$8,459	\$255,000
Total Equipment and Improvements	\$78,992	\$29,968	\$399,000
Less Accumulated Depreciation and Amortization	---	\$1,303	\$32,000
Net Equipment and Improvements	\$78,992	\$28,665	\$367,000
Other Assets	---	\$40,000	\$68,000
Total Assets	\$117,198	\$1,446,257	\$4,963,000
	=====	=====	=====
LIABILITIES AND SHAREHOLDERS EQUITY			
Current Liabilities:			
Accounts Payable and Accrued Liabilities	\$96,370	\$60,311	\$220,000
Accrued Compensation and Related Expenses	\$11,554	\$98,284	\$189,000
Deferred Revenue	---	---	\$179,000
Notes Payable to Shareholders	\$40,000	---	---
Note Payable and Due Within one Year	---	---	\$5,000
Total Current Liabilities	\$147,924	\$158,595	\$593,000
Note Due and Payable After one Year	---	---	\$94,000
Shareholder's Equity:			
Preferred Stock	---	\$1,493,936	\$7,217,000
Common Stock	---	\$51,700	\$131,000
Accumulated Deficit	(\$30,726)	(\$226,769)	(\$2,994,000)
Notes Receivable from Shareholders	---	(\$31,375)	(\$78,000)
Total Shareholder's Equity	(\$30,726)	\$1,287,492	\$4,276,000
Total Liabilities and Owner's Equity	\$117,198	\$1,446,087	\$4,963,000
	=====	=====	=====

EXHIBIT IV

SYBASE, INC.

CASH BURN ANALYSIS
(in thousands)

(fye:12/31)

	1987	1988	1989	1990	1991

Cash Generated (Burned) From Operations					
Revenue	\$6,108	\$18,898	\$41,721	\$69,275	\$114,386
Less: Increase in Accounts Receivable	(\$1,483)	(\$4,080)	(\$2,412)	(\$5,380)	(\$8,880)
Decrease in Deferred Revenue	(\$179)	\$0	\$0	\$0	\$0
Cash Generated From Revenue	\$4,446	\$14,818	\$39,309	\$63,895	\$105,506
Expenses	\$9,323	\$14,479	\$34,526	\$57,749	\$95,440
Adjustments to Expenses:					
Depreciation	(\$63)	(\$109)	\$5	(\$198)	(\$398)
Increase in Misc. Current Liabilities	(\$291)	\$0	\$0	\$0	\$0
Increase in Other Current Assets	\$90	\$0	\$0	\$0	\$0
Increase in Accounts Payable	\$0	(\$126)	(\$258)	(\$368)	(\$622)
Increase in Prepaid Expenses	\$0	\$110	(\$300)	\$0	\$0
Adjusted Expenses	\$9,059	\$14,354	\$33,973	\$57,183	\$94,420
Cash From Operations	(\$4,613)	\$464	\$5,336	\$6,712	\$11,086
Monthly Burn Rate	(\$384)	\$39	\$445	\$559	\$924
ADD Cash From Other Sources:					
Bank Borrowings	\$885	\$2,000	(\$1,557)	\$861	\$1,421
Additional Capital	\$3,320	\$20	\$179	\$6	\$206
SUBTRACT Other Uses of Cash:					
Increase in Property Plant & Equipment	\$76	\$100	\$15	\$240	\$360
Increase in Other Long Term Assets	\$52	\$30	(\$250)	\$0	\$0
Decrease in Other Current Liabilities	\$0	\$200	\$300	\$0	\$0
Decrease in Long Term Debt	\$12	\$15	\$67	\$0	\$0
Total Cash Raised (Burned) During the Year	(\$548)	\$2,139	\$3,825	\$7,339	\$12,354
Beginning Cash Balance	\$4,003	\$3,455	\$5,594	\$9,420	\$16,759
Ending Cash Balance	\$3,455	\$5,594	\$9,420	\$16,759	\$29,112
=====					

EXHIBIT III

SYBASE, INC.

AUDITED INCOME STATEMENTS

	From Audited Financials		
	1984	1985	1986
Revenues:			
Contract - related party	---	\$1,262,000	\$800,000
Porting & Other Contract Services	---	\$4,000	\$66,000
Software License Fees	---	---	\$265,000
Total Revenues	---	\$1,266,000	\$1,131,000
Costs & Expenses:			
Research, Development and Programming	\$5,269	\$1,020,000	\$2,249,000
Marketing	---	\$221,000	\$925,000
General and Administrative	\$25,457	\$284,000	\$848,000
Total Costs & Expenses	\$30,726	\$1,525,000	\$4,022,000
Operating Profit (Loss)	(\$30,726)	(\$259,000)	(\$2,891,000)
Net Interest Income	---	\$63,000	\$124,000
Net Profit (Loss)	(\$30,726)	(\$196,000)	(\$2,767,000)
	=====	=====	=====

EXHIBIT 11

SYBASE, INC.

INCOME STATEMENT PROJECTIONS
(in thousands)

(fye: 12/31)

	1987	1988	1989	1990	1991
Revenue	\$6,013	\$18,898	\$41,500	\$68,400	\$112,800
Cost of Revenue	\$473	\$1,513	\$3,520	\$5,944	\$9,938
Gross Profit	\$5,540	\$17,385	\$37,980	\$62,456	\$102,862
Expenses:					
Engineering	\$2,064	\$2,844	\$5,103	\$8,278	\$13,671
Marketing	\$1,146	\$2,203	\$4,066	\$6,686	\$11,120
Tech. Services	\$2,009	\$2,721	\$5,103	\$8,278	\$13,671
Administration	\$1,133	\$1,425	\$3,798	\$6,246	\$10,286
Operations	\$343	\$510	\$1,899	\$3,123	\$5,143
Sales	\$1,905	\$2,980	\$7,585	\$12,161	\$20,053
OEM Marketing	\$250	\$269	\$654	\$1,077	\$1,777
Total	\$8,850	\$12,952	\$28,208	\$45,849	\$75,721
Operating Income	(\$3,310)	\$4,433	\$9,772	\$16,607	\$27,141
Interest Income	\$95	\$0	\$221	\$875	\$1,586
Interest Expense	0	\$14	\$14	\$18	\$21
Net Income Before Tax	(\$3,215)	\$4,419	\$9,979	\$17,464	\$28,706
NOL Carryforward	(\$6,209)	(\$1,790)	\$0	\$0	\$0
Taxable Income	\$0	\$0	\$8,189	\$17,464	\$28,706
Taxes @ 34%	\$0	\$0	\$2,784	\$5,938	\$9,760
Profits After Tax	(\$3,215)	\$4,419	\$7,195	\$11,526	\$18,946

Income statement projections per Sybase's Business Plan

EXHIBIT I

SYBASE, INC.

1987 JULY YTD INCOME STATEMENT
(in thousands)

REVENUES:	Projected	Actual	Variance
DataServer	\$719	\$666	(\$53)
Datatoolset	\$478	\$542	\$64
Training	\$13	\$16	\$3
Contracts	\$788	\$767	(\$21)
Royalties	\$80	\$0	(\$80)
Maintenance	\$47	\$63	\$16
Documentation	\$6	\$22	\$16
Total Revenue	\$2,131	\$2,076	(\$55)
DIRECT EXPENSES:			
Engineering	\$889	\$770	\$119
Technical Services	\$907	\$779	\$128
Other Product Expenses	\$573	\$564	\$9
Total Direct Expenses	\$2,369	\$2,113	\$256
INDIRECT EXPENSES:			
Marketing	\$813	\$773	\$40
Sales	\$993	\$1,461	(\$468)
Administration	\$652	\$656	(\$4)
Operations	\$184	\$175	\$9
Total Indirect Expenses	\$2,642	\$3,065	(\$423)
Total Expenses	\$5,011	\$5,178	(\$167)
OPERATING INCOME (LOSS)	(\$2,880)	(\$3,102)	(\$222)
INTEREST INCOME	\$78	\$89	\$11
INTEREST EXPENSE	\$0	\$7	(\$7)
NET INCOME (LOSS)	(\$2,802)	(\$3,020)	(\$218)
	=====	=====	=====

Balance Sheet Review (Exhibits V & VI)

Sybase has a strong Balance Sheet. After the recent equity financing, it has \$3.9 million in cash, \$5.1 million in current assets and \$1.1 million in current liabilities.

CONCLUSION

Sybase is positioned to become a substantial player in the relational DBMS market. Relational DBMSs are projected to be the mainstream technology of the future. There is a market niche that wants a high performance relational DBMS that operates on general purpose mid-range computers (Unix & VMS environments) and that can handle multiple users in a distributed environment. Sybase's product addresses this market void and its product is fully developed and debugged. Its approach has been blessed by Microsoft, Apple Computer, and other OEM's. The company has demonstrated the ability to sell the product in the short term. The company has a good management team and high quality venture backing. The company is well capitalized and should have sufficient capital to launch a successful sales campaign. The biggest risk for the company is whether it can penetrate the market before its competition develops a comparable product. In order to duplicate Sybase, the competition would have to scrap their old systems and start all over. Product development would take at least two years.

Income Statement Review (Exhibits I, II & III)

November 1984 through December 1986 (Exhibit III) can be characterized as Sybase's development stage with heavy expenditures for research and development and virtually no sales. The contract revenues are from TRW for the development of a secured data storage product. Porting and other contract services revenue are from companies like Microsoft and Metaphor. These amounts are recognized as income in proportion to expenses incurred in developing the product. These revenues have enabled Sybase to reduce the amount of venture financing needed to develop its products.

Exhibit I reflects July, 1987 year-to-date Income Statement Variance Analysis. Through July, the company sold \$1.2 million of product to end users and had an additional \$800,000 of contract revenue. End users sales are meeting projections. August end user sales were \$750,000, \$358,000 over projected. August sales puts the company way above plan for the current year. The company is behind plan on royalties but feels OEM sales will pickup. Sybase's direct expenses are \$256,000 below projected. Sales expenses have exceeded plan by \$468,000, which are due to Sybase adopting a more aggressive sales campaign than originally planned. The company has opened up eleven sales offices domestically and one in Europe so far this year.

Exhibit II reflects Sybase's pro forma income statements for 1987 through 1991. Sales projections are aggressive but should be attainable. Revenues come from both end user sales and royalties from OEM/VAR sales. The cost of goods sold are nominal because there is virtually no cost associated with making multiple copies of the program. The company projects a profit in the fourth quarter of 1987. Break even sales are approximately \$885,000 per month.

Cash Burn Analysis (Exhibit IV)

During August, the company raised \$3.3 million in venture financing from what is expected to be its final round. The company has been burning \$450,000 per month at a very modest level of sales. At this sales rate, cash will last eight months. The company's end user sales jumped dramatically in August and may cause the company to generate positive cash flow for the month. The company is also expecting royalty revenues of \$100,000 in both September and October.

During 1988, the company expects to generate a positive cash flow from operations of \$464,000 or \$39,000 per month. During 1988, accounts receivable is predicted to grow by \$4.1 million, using a majority of the company's cash. The company is in documentation on an accounts receivable financing package with Silicon Valley Bank, which is expected to close this week.

Mark Hoffman, President and Chief Executive Officer, was Vice President of Operations at Britton Lee prior to co-founding Sybase. He is considered a very competent operations person and a good complement to Bob Epstein. However, prior to Sybase, he had no experience in sales, marketing or finance. The investors are acutely aware of Mark's inexperience but are pleased with Mark's growth to date. The investors also feel Mark is shy and lacks the charisma they'd like in a CEO.

David Turner, Vice President of Finance and Operations, is the weakest link of the management team and lacks any prior finance or controller experience. Prior to joining Sybase in 1985, he worked for Mark Hoffman at Britton Lee for four years as Materials Manager. He received an MBA in Finance from Santa Clara in 1979. The investors feel it was a mistake to make him Vice President of Finance and are keeping a very close watch on him. The investors are particularly concerned about this position because of Mark Hoffman's inexperience in finance. If needed, they will hire a polished CFO next year prior to the IPO drive. Turner's performance to date has been good and he is described as very thorough, hard working and attentive to detail.

Stewart Schuster, Vice President of Marketing, came to Sybase from Relational Technology, Inc. (Ingres RDBMS), one of the dominant players in the RDBMS market, where his latest position was Vice President of Business Development. Prior to that he was Director of Marketing. He also has four years experience as a sales manager for Tandem Computers, the largest vendor of on-line hardware. Sybase's number one priority was to position itself away from the other relational DBMS companies. Stewart helped accomplish this by positioning the product as a high performance on-line RDBMS that could be used for transaction processing in mission critical applications. He is responsible for the extensive publicity the firm has received.

Peter Mork, Vice President Sales, is an experienced sales executive. He trained at Data General in the early 1970's and grew to Regional Sales Manager in 1980. He had a reputation of developing strong sales people. The investors are very pleased with Peter. He has been exceeding his projections thus far. He is forthright and honest. His projections are considered to be realistic estimates of future sales.

FINANCIAL REVIEW

Sybase's product development slipped by three months in early 1987 due to unanticipated bugs in the DataServer. Otherwise, the company has come very close to meeting projections.

at the beginning of each quarter. Metaphor will begin selling this product in the fourth quarter of 1987. David Liddle, President of Metaphor, is on Sybase's Board.

5. Stratus

Stratus sells a high tolerance on-line computer. It will sell Sybase on every module sold. Sybase will receive royalties of \$8,000 per copy. Sales will commence in the first quarter of 1988.

6. Pyramid

Pyramid makes high speed Unix based mini computers which it sells as an OEM for distribution in overseas markets. It recently began a VAR program to sell both its equipment and software systems to companies which will develop turn-key applications targeted for very specific markets. It believes the on-line transaction processing market offers the greatest sales potential.

Sybase has been ported to the Pyramid system to provide the software component of an on-line transaction processing product. Sybase will receive royalties of 50% of the end user sales price. Annual royalties are expected to be \$1 million the first year (beginning September, 1987) and \$1.4 million annually thereafter. Pyramid will install the Sybase product on each of their 16,000 units already installed

These OEM relationships are significant. Each represent a strong endorsement of the Sybase product because each company had to fund the product port to its hardware environment. The Apple and Microsoft endorsements effectively prove the validity of Sybase's concept. In addition, it demonstrates the desire for the product in non on-line applications.

MANAGEMENT

The company's management team has extensive experience in the relational DBMS industry. Mark Hoffman and Bob Epstein co-founded the company in 1984 after leaving Britton Lee. Epstein, Executive Vice President, is considered a technical genius and is one of the most competent people in the industry. He designed and developed Britton Lee's RDBMS and Ingres's RDBMS. He developed the unique Sybase system architecture and is the reason the venture capitalists elected to finance this company. He was instrumental in raising funds from TRW and in developing product development contracts with Stratus, Microsoft, Metaphor and Pyramid. He is described as a motivator and has the intense loyalty of his people.

2. Microsoft Inc.

PLEASE NOTE: The MicroSoft agreement has not yet been officially announced. Please keep the terms of this agreement in the strictest confidence.

In 1986, Microsoft was the third largest independent software company in the U.S. Its product line currently includes the standard operating system used in the IBM compatible micromarket (MS-DOS), a window based operating environment for MS-DOS called Windows, one of the top word processing systems (MicroSoft Word), and an integrated spreadsheet program. MicroSoft does not have a database system.

MicroSoft has developed a new operating system, called OS/2 which will support a new generation of super micros based on the Intel 80386 32 bit processor. These new computers will be used in small multi-user environments. Sybase will port its DataServer to OS/2 and be MicroSoft's multi-user database. MicroSoft has paid Sybase \$300,000 to port this DataServer to OS/2. Sybase will receive royalties equal to 60% of sales price.

Although per unit royalties from this OEM will be small, it is expected to provide an annual royalty stream of \$5 to \$7 million. This OEM is significant because Sybase would not have sold its product to the PC market because it is a low margin highly competitive market segment. Sales are expected to begin in the fourth quarter of 1988.

3. Apple Computer Inc.

Apple Computer recently invested \$1.3 million in Sybase. In its press release (refer to Appendix IV), it indicated the possibility of a future strategic OEM with Sybase. Mark Hoffman stated that Apple has provided \$40,000 to Sybase so it could begin hiring people to work on the Apple port. Sybase will likely port its DataServer to the new 68020 processor based MacIntosh. In any case, the Apple Investment in Sybase establishes credibility in the Sybase product.

4. Metaphor

Metaphor is a start-up value added reseller that develops and designs data interpretation systems on Sun Unix systems and sells them to Fortune 500 companies. Sybase will receive a royalty of \$7,000 per unit sold. Metaphor will pre-pay royalties of \$126,000 (18 copies)

1000 companies in the financial, telecommunications and manufacturing markets and the government. The company expects 60% of its revenue to come from end user sales, of which one-third will be from government sales.

The company has a domestic sales force of thirty people located in eleven offices. The sales force includes sales representatives and sales support people. The company's end user sales are the most important to the company because they have the highest per copy profit margins.

The product sales cycle is three to six months. In the initial sale typically one copy is sold. The customer then develops its application within three to six months. Thereafter, multiple sales will follow when the customer implements the system. This characteristic is typical of the DBMS market.

Actual sales through July were marginally above projected levels. During August, the company sold \$750,000 of product to end users; projected August sales were \$392,000. For September, sales are projected to be \$436,000 and during the fourth quarter of 1987, monthly sales projections average \$517,000.

OEMs & VARs

Sybase has developed several key OEM contracts. The existing and potential OEMs are designed to leverage sales into complementary markets which the company feels it cannot address currently. In each OEM contract, the OEM provides the R&D funds necessary to "port" (enable the product to function in the operating system of the hardware vendor) the Sybase product to its hardware. Sybase also insists on a strategic commitment from the OEM to push the Sybase product. However, most OEM's also offer other relational DBMS products. Sybase has OEM's with the following companies:

1. TRW

TRW has provided Sybase \$2.8 million in contract revenue to develop a high security (B2 level) database to be marketed to the NSA, NSC, CIA. The product is expected to be completed in 1988. Although the technology agreement isn't final, TRW will receive technology rights and Sybase will receive royalties and the right to market the product to non-government users (refer to Customer Reference Interview with Kwang-i Yu of TRW). TRW is not a database company and fears that if it doesn't allow Sybase to profit from and market the product, it will be burdened with maintaining and updating the product. Sybase revenue projections do not include any royalty revenue from TRW.

PRODUCT DEVELOPMENT

Both the DataServer and DataToolset are fully developed and run on SUN 3 hardware and VAX/VMS. Sybase supports two networking protocols: TCP/IP for the SUN/UNIX based environments and DECNET for the VAX/VMS environments. The company will release the third version of its DataServer in October 1987.

In 1988 the company will port its DataServer to the IBM VM environment. In 1989 the company will address the MVS environment. The company is seeking an OEM to fund the port.

In the fourth quarter of 1987, Sybase will release a distributed DataServer which allows multiple DataServers to communicate in a fully distributed network. At this time it will also release a version of a text management system in conjunction with TRW. In the third quarter of 1988 it plans to release its B2 level security database.

MARKETING AND SALES

The company's fundamental marketing strategy has been to position its product as the first relational DBMS designed for on-line applications and to reposition its competition as providing limited decision support RDMS products. To implement this strategy it has adopted an intense publicity and customer awareness campaign that stresses its differentiating features that are the key requirements of the on-line market. To date, the company has received extensive positive publicity in several trade journals. This short term strategy is designed to distinguish Sybase as a new relational DBMS software which provides dramatic improvements over competing systems. In the long run, Sybase will also market its product as a high performance relational DBMS to be used in non on-line applications.

Sybase's products will be premium priced products. Nonetheless, they will offer better price/performance ratios than competing products. The market for DBMS software is not price sensitive. The DataServer and DataToolset will be sold separately.

Sybase will sell its product to two categories of customers, end users and OEMs/VARS. Below is an analysis of each.

End Users

Sybase will sell its product directly to selected end users domestically and abroad. It has targeted worldwide Fortune

1. Networks - The DataServer is designed to operate in a network environment. The DataServer can be accessed from a heterogeneous mix of computers. Competitive products have been designed to work with all programs running in a homogeneous environment and as a result have crude networking.
2. Mutli-Threaded Technology - the DataServers sophisticated multi-threaded architecture can handle hundreds of user while using only a small amount of memory. The DBMS runs as a single process which handles its own multi-tasking (i.e., the job scheduling and record locking). The significance is that switching between tasks can be done in a fraction of a millisecond and a task only requires 16k of memory. Competitive systems rely on a computers general purpose operating system for job tasking and require many milliseconds and require up to 500k of memory per task.
3. Central Data Integrity - The DataServer has the unique feature of allowing integrity rules to be defined in the database. All existing relational DBMSs require data integrity to be done in the applications program. By attaching such rules to the database, application development becomes simpler, and it is possible to change integrity rules without modifying application programs. This also enables data integrity to be performed faster.
4. On-line Availability - the DataServer has been designed so that common maintenance operations can be performed without bringing the database off-line.
5. Precompiled Commands - Relational DBMSs provide a great deal of flexibility at the expense of performance. This is because queries and updates are done in an interpretive manner. Queries are recompiled each time they are run because the underlying database may have changed. Sybase has developed a technique which pre-compiles queries. Prior to executing, Sybase utilizes a proprietary technique to quickly determine if a database has changed since the last execution. If the database has changed, which it rarely does, Sybase transparently recompiles, otherwise it executes the pre-compiled query. The significance of this is that it provides significant performance improvements over competitive systems.

All of these features add up to dramatic performance improvements over competing systems. Collectively, they enable Sybase to operate as a high performance on-line relational DBMS that can support many users.

