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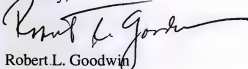
The report examines the information services needs of this marketplace, with special attention to the unique requirements of the industry and the technological and economic realities that are influencing the banking and finance sector. The trends, events and issues driving this market are identified and expenditures are forecast for each of seven information services product/service categories.

Key topics discussed include the institutions' needs to reduce costs, impacts of new electronic services, the Internet and its potential in this market, trends toward outsourcing and away from processing services, and the impacts of acquisitions and mergers on the information systems function. The analysis of the technology trends and other industry issues, together with other INPUT research, is used to project the growth in the banking and finance market for information services over the next five years—a market that is growing at a steady 12% compound annual rate through the year 2000.

Your purchase of this report includes access to our consultants who will be happy to answer any questions that you may have regarding this, or other INPUT reports which you receive.

You should file this report in your MAP Program binder, behind the tab marked Banking and Finance.

Sincerely,



Robert L. Goodwin
Vice President



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January 1996

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Abstract

This report examines the banking and finance industry sector, considers the trends, events and issues affecting this industry, notes the impacts of these forces on the information systems function supporting institutions in this industry, and provides a detailed forecast of the information services market from 1995 to 2000 for seven product/service categories, including professional services, systems integration, outsourcing, processing services, network services, applications software products and turnkey systems.

Vendor competition in this market is considered, with market share estimates for the leading vendors to the industry and profiles of three major vendors. Conclusions and recommendations for banks and financial services companies and vendors are provided. A detailed forecast database is included as an appendix.

The report has 78 pages and contains 19 exhibits.



Published by
INPUT
1881 Landings Drive
Mountain View, CA 94043-0848
United States of America

**U.S. Information Services Market
Analysis Program**

***Information Services Markets, 1995-2000
Banking and Finance***

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I

Introduction

A

Purpose and Methodology

1. Purpose

There are five basic objectives of this MAP vertical market report:

- *Industry Demographics* - Introduce the reader to the structure and demographics of the banking and finance market sector.
- *Business Issues and Trends* - Identify the business issues and trends that are driving the use of information services within the banking and finance sector.
- *Systems Uses and Issues* - Discuss how the banking and finance sector uses information systems, and the issues facing banking and finance information systems organizations.
- *Information Services Market* - Discuss the information services market within the banking and finance sector, including market sizing and factors driving market demand for each delivery mode.
- *Competitive Environment and Vendors* - Discuss the competitive environment and profile a selection of leading information services vendors in the banking and finance market sector.

2. Methodology

Ongoing Research—Much of the data on which this report is based was gathered during 1995 as part of INPUT's ongoing market analysis program. Trends, market sizes, and growth rates are based upon INPUT research and in-depth interviews with users within the banking and finance sector and the IS vendors serving this market. INPUT maintains ongoing relationships with, and a database of, all users and vendors that it interviews.



Interviewees for the research portion of this report were selected from this database of contacts.

Resources—Extensive use was made of INPUT's corporate library, located in Mountain View, California. The resources in this library include on-line periodical databases, subscriptions to a broad range of computer and general business periodicals, continually updated files on over 3,000 information services vendors, and the most up-to-date U.S. Department of Commerce publications on industry statistics.

Forecast Estimates—Vendors, when responding to interviews or questionnaires, may be unwilling to provide detailed revenue breakouts by delivery mode or industry. Also, vendors often use different categories of industries and industry segments, or view their services as falling into different product/service categories than those used by INPUT. Thus, INPUT must estimate revenues for these categories on a best-effort basis. For this reason, the product/service and individual segment forecasts should be viewed as indicators of general patterns and trends rather than specific, detailed estimates for individual years.

When information is provided by vendors as requested, it is often offered under an agreement of confidentiality. Therefore, vendor rankings based on revenue figures should be viewed as approximations.



B**Industry Structure**

For purposes of this report, the U.S. banking and finance sector will be segmented as shown in Exhibit I-1.

Exhibit I-1

Banking and Finance Industry Segments and SIC Codes

SIC Code	Industry Segment
60	<i>Depository Institutions</i>
601	Central Reserve Depositories
602	Commercial Banks
603	Savings Institutions
606	Credit Unions
609	Functions closely related to banking
61	<i>Nondepository Institutions</i>
611	Federal and Fed-sponsored Credit
614	Personal Credit Institutions
615	Business Credit Institutions
616	Mortgage Bankers and Brokers
62	<i>Security and Commodity Brokers</i>
621	Security Brokers and Dealers
622	Commodity Contracts Brokers/Dealers
628	Security and Commodity Services
67	<i>Holding and Other Investment Offices</i>
671	Holding Offices
672	Investment Offices
673	Trusts (incl. religious, educational, etc.)
679x	Miscellaneous Investing

Source: INPUT

As this exhibit shows, the banking and finance sector consists of much more than just banks, brokers and S&Ls. The disaggregation of the financial services business—and the associated rise of specialized financial institutions—is an important trend that is strongly related to the development of information technology. The breadth and diversity of this sector are important factors that should not be overlooked by information services vendors.



C

Report Organization and Contents

The remainder of this report is organized as follows:

- Chapter II—*Executive Overview*
- Chapter III—*Trends, Events and Issues*—provides background information on the business issues and trends that are driving the use of information services within the banking and finance sector.
- Chapter IV—*Impact of Trends and Issues on Information Systems*—provides an overview of the basic business processes in the banking and finance industry and their supporting information systems applications. For example, a discussion of how the banking and finance industry uses information systems to operate and manage its business activities is included. Networks and data communications are also included in this analysis.
- Chapter V—*Information Services Market Forecast*—identifies the total information services market for this industry sector and notes expenditures for the following product/service sectors in the banking and finance market:
 - *Professional Services*
 - *Systems Integration*
 - *Outsourcing*
 - *Processing Services*
 - *Network Services*
 - *Applications Software Products*
 - *Turnkey Systems*
- Chapter VI—*Competitive Environment*—analyzes the competitive climate for this market sector and offers a selection of profiles of information services vendors serving this market sector.
- Chapter VII—*Conclusions and Recommendations*—reviews the trends and opportunities described in the report and provides recommendations for vendors as well as users.



- **Appendix A—Forecast Database**—The forecast database offers a yearly forecast, from 1995 to 2000, of user expenditures, by product/service sector, for the banking and finance market. The forecast reconciliation compares this report's forecast with the forecast provided in INPUT's previous banking and finance market report and explains the reasons for any major differences.

D

General Business Trends and Events

As documented by the U.S. Department of Commerce, economists and business journals, the U.S. economy ended 1994 on a high note—perhaps too high from the Fed's viewpoint—with growth at approximately 4.6%. Because employment has also returned to an acceptable level, there is some concern that the strong growth increases the threat of inflation for 1995. However, January's gain in employment—134,000 people—was well below 1994's monthly average gain of 290,000. This decrease has generally been regarded by both economists and the financial markets as the first solid evidence of slower growth. Most economic observers now feel that growth should slow to around 2% by the third quarter of 1995, giving the American economy what some economists are calling a "soft landing." There is also general agreement that the economy seems to be in a mid-cycle slowdown, and that long-term, the risk of that slowdown becoming another period of recession in late 1995 is low.

From a financial markets viewpoint, in 1994 bond yields rose nearly 200 basis points, and the Federal Funds rate was up 250 basis points. In 1995 most market analysts expect the Fed rate to top out at 6.0% (which it has—see below), bond yields to move sideways and S&P 500 earnings to increase approximately 7%—an amount smaller than in 1994. In general, most sectors of the U.S. economy should grow more slowly in 1995 than they did in 1994—the result of slight decreases in productivity and price/cost pressures. U.S. manufacturers are still restructuring, emphasizing cost-cutting and downsizing, and, coupled with the early-1995 weakness of the dollar (especially against the yen), world markets should find U.S. goods attractively priced. Imponderables remain the short-term impact of supports for Mexico's peso and trade disputes with China and Japan. These situations have the potential for significant short-term volatility, but in the long run should have little effect on the U.S. economy's return to modest, steady growth. Inflation in 1995, as measured by the Blue Chip consensus of approximately 50 private-sector economists, is expected to be at a conservative 2.9%, growing slightly through the year 2000 to a maximum of 3.3% (1996 and 1997) and then declining to 3.0% by the millennium.

In support of the long-term economic theories summarized above, the most encouraging (and pragmatic) sign of a healthy economy was seen on July 7,



1995, when after a prolonged period of rate increases dating back to early 1994, the Federal Reserve lowered the Federal Fund Rate by 1/4%—from 6% to 5.75%. The amount of adjustment is small, but the direction of the move is seen by most financial and business analysts as extremely positive, and a signal that the economy has stabilized and that inflationary influences are now under control.

Overall, however, the outlook for the U.S. economy in 1995 is for controlled, steady growth in the 5.7% range with inflation at about 3%, and corporate after-tax profits at approximately 7%, down slightly from 1994's 10%.



II

Executive Overview

The U.S. banking and finance sector has recovered from the position of three to four years ago, when banks were so burdened with bad debts that they were losing in competition with Japanese and other banks for lending business in situations at home as well as in foreign markets. Today:

- U.S. banks and other financial institutions are much more successful in lending in both the home and global markets.
- U.S. banks have taken a leading role in serving middle-market multinationals, as well as providing credit to the giant multinational or global corporations targeted by all leading banks.

Over the past three years, bank earnings have been improving as a result of low interest rates. Profits from loans and investments have been rising and loan losses have been falling. As a result, the return on equity has climbed steadily and should be nearly 15% in 1995 for the top tier of banks. Thus, banks and financial institutions are more able now than in the past three or four years to invest in information systems.

A

Trends and Issues Affecting Information Services Use in Banking and Finance

1. Key Factors

A major factor affecting banking at this time, according to bank respondents, is the increasing industry consolidation/merger/acquisition activity. This activity is strategically important for banks' competitive position, growth, geographic coverage and profitability, but the opportunity to reduce costs is of highest importance. For instance, information technology (IT) efficiencies can help to reduce costs when banks consolidate. Expenditures on IT and outside services can also be a primary target for cost reduction and better return.

Banks operated in a complex environment, as the factors affecting banking listed in Exhibit II-1 illustrate.



Exhibit II-1

Factors Having an Impact on Banking in the United States

- Need to reduce costs (both personnel and marginal products)
- New electronic services
- Low margins and competition brought about by technology
- Expanding retail services
- Interstate banking expansion

Source: INPUT

McKinsey estimates that the number of tellers and full-time staff was steadily cut back in the late 1980s and 1990s at American banks. For example, Chase Bank and BankAmerica stand out for the steps taken in 1994 to evaluate and cut back selected operations. In addition:

- Substantial cutbacks in its U.S. staff were announced in 1995 by NatWest.
- The merger of Fleet and Shawmut announced in 1995 will result in a reduction of about 3,000 people, many in data processing.

The reduction of personnel has not led to a decrease in banking services, however. New technology and the use of vendors by bank and nonbanks has supported an increase in overall service quality. Examples include:

- Productivity has increased at most banks and new services are emerging, such as the improved forms of home banking offered by Chase Manhattan and the expanded cash management and trust services offered by Chemical Bank (which provides balance and transaction detail rapidly enough to enable clients to manage cash flow).
- Credit lines and/or financial services are being offered by Schwab, Merrill Lynch and other brokerage companies that provide integrated banking and brokerage services.
- Bank processors such as First Data, GECC, Comdata and other technology companies provide card-based services through business arrangements and alliances with banks.

The second major factor impacting banking IS expenditures is electronic banking—a set of new or enhanced services that banks are starting to offer. Planning for these new services is difficult, and is further complicated by the fact that many bank executives are concerned that electronic banking allows more competition from technology companies. For instance:



- Technology companies can offer home banking or electronic commerce through networks such as the Internet or cable facilities and settle business through selected banks—perhaps banks that they have acquired.
- Banks are concerned about how they can take steps to develop and test electronic banking capabilities that will maintain a competitive advantage over nonbanking, as well as banking, competitors.

One bank executive said that using the Internet was like “Stepping into the wild West of yesterday,” but felt that it should be attempted in order to maintain a leadership position, as well as to avoid competitive surprises.

Although banks must constantly remind themselves that banking customers’ needs are more important than the use of technology itself, technology has helped the competitive activities of brokerage firms, as well as technology firms. Also, technology has changed banking so that many of the services and products are like a commodity business at low margins. Customer services are the only means of differentiating these functions, according to Vice Chairman of BankAmerica, Martin Stein—and technology is needed to accomplish that goal.

Consequently, there is a need to maintain competitiveness in customer services as well as through cost reduction by investing in computing technology.

2. IT Activities Planned by Banks

Because banks are interested in cost reduction wherever it can be achieved and service improvement to both retail and wholesale customers, it is not surprising that there is interest in upgrading or changing a wide range of applications, including basic deposit, checking and lending systems, as shown in Exhibit II-2.

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Exhibit II-2

Banking Applications and Technologies Driving IT Development in the United States

Application or Technology
<ul style="list-style-type: none">• Check/Deposit Systems• Loan Systems• Credit Card/Debit Card/ATM• Imaging• Electronic Banking• CIF (Customer Information Facility)

Source: INPUT

- Both large and small banks anticipate changing check/deposit and loan systems to save costs as well as to improve services.
- Functions are being downsized from mainframe deposit and lending systems to serve customers or groups of customers more efficiently with client/server systems, as well as to provide more functionality to clients.
- Changes are also being made in lending and deposit functions that enable more information to be provided to cash management and/or relationship management systems, as well as to CIF systems. These changes are more important to larger banks which can use the information to serve customers better and to analyze the effect of additional customer business on revenues and costs.

However, smaller banks (below \$1 billion in assets) have expressed interest in relationship management and Customer Information Facility (CIF) capabilities and have reported that there are software vendors with products that address their needs.

Changes or upgrades to CIF capabilities are of interest to most commercial banks, although banks above \$5 billion tend to consider the need for these changes more urgent. Larger banks are also more interested in the use of imaging to save costs and facilitate retrieval of check and other information.

Both large and small banks are interested in credit card processing and debit card/ATM systems and some larger banks have gained substantial fees from these services. Depositors, as well, are interested in these capabilities. In addition, smaller banks in many locations need such services to attract depositors.

Technology is allowing banks to provide better service to corporate and personal accounts. For example:

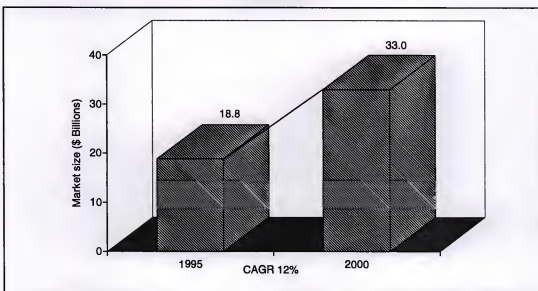
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- The use of technology to maintain customer relationships and attract new depositors is reflected in products for home and remote customers, such as the new screen phones offered by Citibank and NationsBank.
- A service has been introduced to integrate a customer's management of his or her finances with the banking services offered by Chase/Chemical through the use of Microsoft's *Money* and Intuit's *Quicken* products.

Based on the above as well as other key factors detailed in this report, INPUT projects the 1995-2000 information services market for the banking and finance industry to grow as shown in Exhibit II-3. INPUT forecasts that the overall expenditures in this market will expand from slightly more than \$18.8 billion in 1995 to more than \$33.0 billion by 2000, at a compound annual growth rate (CAGR) of 12%.

Exhibit II-3

Banking and Finance Market 1995-2000



Source: INPUT

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Trends, Events and Issues

A

Overview

This chapter discusses trends, events and issues in the banking and finance industry.

Section B highlights banking industry consolidation as a key trend.

Section C examines the threat of significant competition from non-banks, particularly in electronic financial services.

Section D discusses the role of the Internet in lowering IT costs and enabling new banking delivery channels and services.

Section E notes other important trends, events and issues affecting the banking and finance industry.

Section F focuses on technology trends and their impact on this industry.

B

Banking Consolidations

1. Banking Industry Environment

There are 102 U.S. banks among the top 500 banks (20%) in the world based on assets. These banks are part of the industry segment under SIC 60 in Exhibit I-1. Of note:

- There is a high level of concentration of business in these institutions. For instance, 70% of the \$3.4 trillion in assets of the 10,000 commercial banks are controlled by the top 3% or about 385 banks.
- Approximately 65% of the assets of savings institutions are controlled by 8% (about 200) of these institutions.



Ten years ago, the top 3% of commercial banks held about 63% of assets, an indication of the trend toward increased concentration of assets. (There were about 14,400 banks in the mid-1980s—see Exhibit III-1.)

Exhibit III-1 provides a detailed breakdown of the changes in the number of banks for each of the years 1984 through 1994. Except during 1985 and 1986, voluntary restructuring accounted for more of the changes than did bank failures. Although bank failures have received a great deal of publicity, far more new banks started than old banks failed during the ten-year period from 1984-1994. The primary reason for the net reduction in the total number of banks has been the large number of mergers, averaging more than 400 per year over this same eight-year timeframe.

This pattern should continue over the next several years. New banks will still be created, especially in newly developed areas with rapidly growing populations. Bank mergers will continue at the same general pace until restrictions on nationwide branching are removed. And bank failures will likely decline as earnings continue to improve and banks continue to improve their capital reserves as required by regulatory authorities.

Exhibit III-1

**Number of Insured Banks at Year End: 1984-1994
(Continental U.S. Territories and Possessions)**

Year	Main Hqs Offices	Branch Offices	Total Offices
1994	10450	55144	65594
1993	10957	53121	64078
1992	11465	52438	63903
1991	11926	52484	64410
1990	12345	50815	63160
1989	12713	48084	60797
1988	13137	46619	59756
1987	13722	45701	59423
1986	14209	44356	58565
1985	14417	43347	57764
1984	14496	41907	56403

Source: Federal Deposit Insurance Corporation, Division of Research and Statistics

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Banks are often categorized in terms of their sphere of business activity—money center, superregional, regional, subregional—and this helps to identify their business strategies and what services or products they need to support. For example:

- As a result of changing business and mergers, there are overlaps among the categories. For instance, some of the superregional banks compete with money center banks for global as well as domestic lending business.
- The money center banks include institutions such as BankAmerica, Bankers Trust, Chase, Chemical (Chase and Chemical are merging), Citicorp, J.P. Morgan, Mellon and First Chicago. They are interested in improved lending/funding systems and treasury or dealing systems, as well as upgrading domestic and international networks.
- Superregionals—including NationsBank, Wachovia, Fleet/Norstar and BancOne—are interested in lending and dealing systems, upgrades to networks, improvement in cash management applications and extensions of ATM networks.
- Regional, subregional and local banks such as United Missouri, Liberty National, Fidelity and First American are interested in ATM networks and upgraded lending and deposit systems, as well as improvement in customer statements and downsizing to client/server systems.

2. Bank Consolidations to Accelerate

There were slightly more than 10,000 banks in the U.S. near the end of 1995. Based on merger and acquisition trends, INPUT forecasts that the number of banks could decline to the 8,000 to 9,000 level by the end of the year 2000. This is a more conservative estimate than industry sources have made, which is in the 5,000 to 7,000 range. INPUT feels that consolidations will take a somewhat longer time, since the joining banks will continue to go through a rigorous process of determining how best to consolidate.

The mid-1995 announcement of the consolidation of Chase and Chemical Banks in New York City strongly illustrates the potential at the large national and global bank level. Strong regionals such as First Union and NationsBank are pinpointing acquisitions that give them a larger regional influence as well as capitalizing on opportunities for economies of scale in check processing and branch consolidation/elimination.

Notwithstanding bank consolidations, there is a flurry of new bank formations—particularly local one-branch banks that target a specific marketplace with unique needs. Silicon Valley Bank in Northern California,



as its name suggests, has found a good home among the emerging technology companies in that region.

3. Deregulation Means Survivors Will Do More

The efforts in Congress to revise the Glass-Steigel Banking Act are probably within months of yielding substantial deregulation that can permit banks to offer insurance, brokerage services and other activities currently prohibited. This is an important trend that will put a new focus on bank consolidation.

Not only will banks be able to consolidate to achieve greater geographic coverage and improved profitability, cost eliminations and scale economics in operations, but they will also have a "platform" from which to offer new services as the terms of new deregulation permit.

And, throughout the period of consolidation and deregulation that will occur over the next five to ten years, the impact of information technology and the use of information services and network services will be substantial. Networks will provide the means to coordinate operations among the larger consolidated bank institutions. The same networks will permit customers to have access to an even wider range of financial services without physically having to visit a bank branch.

4. Consolidations in Other Financial Sectors

For thrifts, brokers and securities firms and other financial sectors, consolidation is also a significant factor. Here the drivers are not only cost savings and regional expansion among similar types of institutions, but also banks themselves will be looking at these other financial entities, as deregulation permits them to expand their service base. For many institutions, it will be a much better business decision to acquire a customer base and operating business than to start a substantial financial services business from scratch.

The provision of one-stop broad financial services offerings will be a growing objective of large commercial banks and other large financial institutions.

C

Banking Applications Provided By Non-Banks

1. Who Needs Banks?

"Who needs banks?" is a question being raised more and more in industrial and consumer circles. Many nonbank third parties are lending funds,



issuing credit cards, and even taking deposits—activities that a few years ago were the sole function of financial institutions and their branches.

Credit cards probably represent the best example of what has happened. On the issuing side, in the past four to five years, several major nonbank organizations, including AT&T with its Universal Card, General Motors, General Electric and GTE Corp., have entered the credit card marketplace. It is estimated by Visa and MasterCard that now over 50% of new credit cards are issued by these nonbank entities.

On the authorizations and settlement side of the credit card business, third parties now account for close to two-thirds of the business activities supporting the credit card business. Third-party vendors such as First Data, Total, National Data Corp., Equifax, and Deluxe are the leaders in providing these financial services once totally dominated by banks and their own subsidiaries.

Is the loss of market share by banks in credit cards a precursor of further loss of market share in other financial service areas? INPUT believes this is probably the case for several reasons. First, many of the new financial services to which nonbanks are paying attention are in technology-based delivery areas. Microsoft with its Microsoft Network and its announced intentions to deliver electronic financial services is equipped to step into the bank arena. In addition, Microsoft and others bring no “excess baggage” with them. Microsoft has no bank branches; its banking activities are likely to be all electronic from the very beginning, whereas banks have to go through consolidation and undo investments and commitments to current channels of distribution while taking the risk of technology development and new investments.

Banks have also responded slowly and conservatively to the emerging on-line consumer financial services provided by nonbanks. Subsidiaries of GE, Sears and Amex, and information services companies such as Microsoft and Intuit, have made the moves. Banks are responsible for little of the innovation transforming their industry. However, some banks such as Citicorp and Wells Fargo have announced advanced products.

Banks were very concerned about the possible Microsoft-Intuit merger. This reaction is symptomatic of the difficulty that many banks have in planning and driving their own future. As *PC Week* noted, “Failing to respond to challenges posed by consumer electronic banking is an area where conservatives could cost traditional banking institutions dearly.”

Banks do have a legal claim to some services or components of services such as money transfer, letters of credit, settlement of checking and draft activities and certain types of credit. However, a number of services or service components (e.g., credit card activity) can move to nonbanks.



2. Applications Most Likely to Be Supported by Nonbanks

In addition to large portions of credit card work, components of other services are also likely to be done with the assistance of third parties. These include:

- Electronic payment services, including some new services based on digital purses and "smart" cards
- EDI payments for commercial ordering and distribution systems
- Electronic checks
- Payment and transfer services provided through personal computers
- Electronic commerce purchases made over the Internet

The above represent areas that are being targeted by third parties to make further inroads into banks' market share of overall financial services. These are some areas in which banks must concentrate their efforts to thwart further intrusions.

3. The Future

INPUT feels that banks have begun to recognize the threat of non-bank third parties to their market share providing financial services, but they are going to need help from information services vendors in order to provide the professional services, systems integration, outsourcing and other services that will be needed to catch up quickly and to implement new applications and distribution systems based on technology.

D

The Role of the Internet

Whether delivered by third-party nonbank or banking and finance institutions, banking and financial services are going to benefit dramatically from the Internet over the next decade and beyond.

Fundamentally, the Internet will provide lower cost communications to encourage expansion of communication-based banking and financial services. In addition, new electronic financial services will be created and offered over the Internet. The World Wide Web attribute of the Internet permits banks to display and offer services to customers who have PCs and can access data networks. As a result, existing services can receive new exposure and utilize a new channel of distribution, and new services can be widely promoted and made available immediately.



Wells Fargo and First Union are two banks that have set up World Wide Web sites and indicate they will expand their service offerings dramatically over the next few years.

Communication costs can be lower using the Internet than with other on-line computer services, which rely on specialized or value-added networks. This is because costs on the Internet are minimal; however, it does not offer many of the services and capabilities available over commercial networks. For example, customer service applications support and security services are not available through the Internet. These must be developed and added on by the services vendors who sponsor the World Wide Web-based applications. The cost of these value-added features has to be built into the prices charged by the sponsors for the Internet-based services. However, in most cases, even after adding these charges, the lower communication costs of the Internet will keep total costs much below those of commercial networks.

One of the most significant deficiencies of the Internet is the lack of security provided for transactions and financial payments/money transfers. This is being addressed by everyone from MasterCard and Visa to Netscape and Microsoft, as well as by new vendors of specialized Internet-related payment systems such as CyberCash and First Virtual Systems.

Though there have been some false starts in successfully implementing security sufficient to satisfy users, INPUT believes this security problem will be solved in the next two to three years.

The Internet service that is available now will also expand. For example, today's World Wide Web is basically a static service, in part because of the limitations of relatively low transmission speeds. In the future, interactive services and full-motion presentations will be available based on a 10- 100-times growth in bandwidth of the basic Internet backbone.

All told, the Internet may be the single most important factor in the growth and expansion of electronic banking services over the next decade as it provides additional channels of distribution for banking and financial services.



E**Other Trends, Events and Issues**

Other trends and events affecting the U.S. banking and finance industry in the late 1980s and early 1990s include a number of topics other than electronic banking and consolidations, as shown in Exhibit III-2.

Exhibit III-2

**Other Key Topics Impacting the
Banking and Finance Industry**

- Profitability and the need for cost reduction
- Securitization
- Brokerage expansion into new service areas
- Nonbank financial services firms

*Source: INPUT***1. Bank Profitability**

The declining interest rate environment in 1993 and 1994 had two key effects on the banking industry:

- By reducing corporate borrowing costs from the levels of the late 1980s, many potential bankruptcies have been averted and associated bank losses have been reduced.
- By reducing bank borrowing costs:
 - Bank earnings and capital have increased
 - Bank failures have been reduced
 - The bank insurance fund (FDIC) has grown faster than originally anticipated

The result: an overall improvement in the banking environment, reducing the public perception that this is a problem area which needs constant scrutiny and legal or legislative control.

The low-interest-rate environment has also increased the value of the Resolution Trust Company (RTC) portfolio of foreclosed real estate and defaulted loans. In addition, despite massive startup problems caused in part by inconsistent legislative direction and support, the RTC has become more effective in managing and disposing of its inventory. This has further



reduced the public perception of banking as a troubled and unprofitable industry.

Although the industry in general is more profitable, margins are tight, driving the interest in cost reduction, consolidation and increased use of fees. Where possible, banks have been shifting more of their income into fee-based businesses. This makes banks more financially stable in two important ways:

- Fee-based income is steadier, and not as subject to cyclical business risk as is interest income.
- Unlike lending income, where the loss from a defaulted loan also requires a capital writedown to reflect that loan loss, a loss of fee income has little or no impact on capital. Most fee-based businesses are grounded on systems that have been expensed, and current operating expenses (staff, occupancy, etc.) that can be easily changed.

According to a study by Merrill Lynch, the noninterest portion of major banks revenue reached about 40% by the end of 1994. Part of this came as a substitute for interest income, as depositors took funds out of ordinary bank accounts and put them into mutual funds managed by the same banks. Knowing they would suffer from disintermediation when interest rates dropped, many of the large banks established their own mutual funds in order to retain the money and the account relationships. However, banks have also moved aggressively into corporate finance and advisory work, which was once the province of traditional investment banks. Unbundling account relationships and charging fees for services previously provided free under "compensating balance" arrangements is another source of fee-based income for many banks.

2. Securitization

Securitization is the packaging for reselling and/or trading of blocks of loans of all types. The lending agency that packages loans in this way earns a fee for the packaging and moves loans off the financial books, thus freeing the capital for lending—and securitizing—once again. Securitization has been a popular tool for all kinds of financial institutions seeking to get assets off their books in response to pressures of capital adequacy and the demand for additional lendable funds.

A major reason for the S&L's loss of mortgage business has been the increasingly widespread securitization of mortgages through GNMAE, FNMAE, and others, thus permitting low-capital mortgage brokers and others to compete easily, often under lower cost structures.



Although in recent years many banks jumped into securitization of credit card portfolios, this trend has slacked off as profits have improved and banks are better able to hold on to the high profits available from a well-managed portfolio. This has allowed banks to shift their focus away from securitization and toward bulk disposal of distressed properties and loans as an alternative way of raising limited amounts of cash and cleaning up their balance sheets at the same time.

3. Brokerage Business

Over the last several years, both small and large investors diverted savings to purchases of stocks, bonds and mutual funds. Despite many problems in other sectors of the economy—including uncertainties associated with the 1994 congressional election and the administration's economic plan—the equity market has done well and new issues have appeared in record numbers. In general, retail brokers did very well.

Despite this trend, however, brokerages are still concerned about long-term trends in volume, discounts in service charges and competition from banks. For instance:

- Increasing sophistication and cost consciousness on the part of individual investors fuels the growth of discount brokerages and constrains the growth of traditional full-service retail brokerages.
- The growth of mutual fund sales by banks is also having an impact on the retail brokerage business.
- The continuing growth of institutional holdings (e.g., pension funds) and mutual funds decreases the total number of trades, and also reduces commissions as more and more of the trading volume is accounted for by movements of large blocks.
- The growth of off-exchange markets, electronic crossing, and other similar innovations leads to reduced business for exchanges and specialists, as well as reduced commissions for both brokers and specialists. Brokerage firms need volume and commission income to fund the growth of the research and processing capabilities now required by clients.
- Trading is becoming an increasingly complex activity, with real-time mathematical modeling, graphic displays, multimedia data feeds, large databases, etc., becoming the norm. This requires continuing emphasis on technology planning.



- Continuing regulatory pressure, including the June 1, 1995 shift to T+3 settlement and the drive to immobilize securities, is also increasing the need for technology planning and expenditures.

Offsetting these worries are other trends that may increase the volume and profitability of the brokerage business. The increase in initial public offerings (IPOs) is contributing greater volumes of business. As economic restructuring continues and new firms are born out of the creative destruction of defense industries and military bases, there should be an increase in this kind of activity. In addition, as banks gain increasing powers to compete in the securities arena under the administration's policy of establishing a "level playing field," securities firms may gain additional powers to enter traditional banking markets or use parts of the banking industry's support structure (e.g., routine access to the Federal Reserve discount window).

4. Nonbank Financial Services Firms

As mentioned in several of the sections above, a strong new class of banking industry competitors is emerging—nonbank financial services firms. Whether in credit cards, lending, or nondepository interest-bearing accounts such as money market funds, more and more non-bank institutions serve the financial needs of today's individuals and businesses. These institutions generally are well capitalized—often by industrial-sector parent firms—and generally operate free of most of the regulatory constraints imposed on banks and S&Ls.

In addition to simple lending, a wider range of banklike services is available from essentially unregulated competitors like General Electric, Sears Roebuck, General Motors, and American Express. Many of the largest industrial firms have established captive finance arms to support the lease or purchase of expensive capital equipment. Because they know the customers, the products and the market, these firms are often able to make sharper credit decisions than a bank, and have more ways to dispose of equipment returned from lease.

There is every reason to believe that nonbanks will continue to win business from traditional banking firms in the future—and thus will invest more in information systems and information services than will banks.



F**Technology Trends**

Exhibit III-3 summarizes the information technology issues that must be addressed by the banking and finance industry in the second half of the 1990s.

Exhibit III-3

**Information Technology Issues Facing
the Banking and Finance Industry**

- Communications and the Internet
- Management of established technologies
- Evolution of imaging
- Expert systems
- Outsourcing
- Distributed systems and integrated databases
- Workstation/PC convergence

Source: INPUT

1. Communications and the Internet

Most banks are increasing their use of local-area networks (LANs), often in client/server configurations, and the larger banks are now integrating multiple LANs, connecting them with wide-area networks (WANs), and centralizing control and backup operations. So far, there seems to be little movement toward integrated systems digital network (ISDN) communications technology.

Global improvements in communications services offered by major telecommunications vendors have also led many banks to abandon their private networks in favor of virtual networks run on regular public circuits. (Some of the largest banks and other financial institutions have invested in complex networks, however.) Network management is also increasingly contracted out to telecommunications vendors, leaving the banks with a small core of professionals to monitor the quality of vendor service and plan the evolution and integration of communications networks with the bank's information processing strategy.

The Internet's attributes of low cost and its ubiquitous nature are attracting many banks to this new communications resource. As noted earlier, banks such as Wells Fargo have established Web (World Wide Web) sites and are offering services to customers with PCs and data network access capability. What is the future of banking services on the Internet? Excellent, INPUT



believes. Current limitations such as security and available bandwidth will be overcome through technological innovation and capitalistic motivation as more individuals and businesses become habitual Internet users. Cost-conscious banks will note with pleasure the minimal investment requirements for a Web presence and the long-term cost benefits of banking services provided to screen-based users who can then follow simple on-line prompts to perform most financial transaction functions.

In the mid-1990s, most Internet activity is either information- or sales-based. As familiarity, confidence (improved security) and availability (more bandwidth, fewer performance inhibitors) grow and improve, there will be a strong growth in both individual and business-related value-based activities (e.g., account balance, cash transfers). Individual confidence in executing security transactions, paying bills and performing most personal financial transactions (all activities being performed today) likely will carry over into the business community, where reduced costs will provide an additional inducement to use the Internet.

2. Management of Established Technologies

A number of information technologies are already well established in the banking and finance industry. The two most significant of these are noted below and share a common attribute—each automates a traditionally labor-intensive function, improving service to the customer and reducing financial institution labor costs. Although these technologies are mature in the sense that they now have almost universal acceptance, they are still evolving as the technology continues to evolve. In both cases, however, except for the cash dispensing/deposit accepting (and similar physically dependent activities) attributes of ATMs, both technologies offer services that can be provided just as well as using the Internet.

Touch-Tone/Voice Response Phones—It is becoming very common for banks, brokerage firms, and other financial institutions to use voice response systems to allow customers to obtain balances, records of checks cashed and deposits, and other information from touch-tone phones. Customers are also able to perform certain transactions over the phone, such as transferring funds between accounts, paying bills, purchasing stocks, etc.

ATMs—ATMs are now accepted alternatives to routine transactions with human tellers. The early competitive advantages that some banks gained by being ATM pioneers have now largely evaporated, and ATMs are essentially a competitive necessity. Newer generations of ATMs allow an increasing range of transactions, such as data input for loan applications and issuance of travelers' checks. ATMs can even serve as two-way TV terminals, allowing customers to speak directly with bank officers to transact business.



3. Evolution of Imaging

For some time, imaging has been considered an important new technology. The following paragraphs discuss the issues relevant to the banking and finance industry's use of imaging technologies.

Types of Imaging Systems—There are two general types of imaging systems in use by financial institutions:

- File-folder systems, used in areas such as loan processing
- Item processing systems, used primarily for high-volume check processing

Motivation—For both types of systems, the primary motivator is typically cost savings. In practice, however, the savings are difficult to measure. A better justification is usually found in improved quality of service or restructured applications through the use of workflow analysis or process reengineering. For instance:

- Better, faster and more flexible access to documents improves productivity while giving customers better service.
- Corporate services such as account reconciliation and investigation of questionable items can be substantially improved by providing custom reports generated from images of the processed checks.

Costs and Benefits—For file-folder systems, the cost/benefit is increasingly attractive. Because these are typically departmental systems that require little interface to other applications or networks, they can be easily implemented and are often available on a turnkey basis. But for item-processing systems, cost and performance are still major stumbling blocks.

A major advantage of check imaging is supposedly the capability to automatically recognize the check amount. Though this feature works reasonably well with computer-generated checks, there is a countervailing drive to replace such corporate payments with ACH funds transfers, thus diminishing the long-term utility of this feature. The performance problem is with handwritten amounts. So far, the promised performance rates have not been achieved, requiring a higher-than-planned rate of manual data entry for these checks. For a bank with a predominantly retail customer base, this makes the cost high in proportion to potential benefits.



4. Expert Systems

Despite predictions in the mid-1980s, expert systems have not been implemented successfully in as many applications as first anticipated.

Credit scoring—the analysis of a credit application to determine if a loan or credit line should be granted—is one of the oldest and most successful applications to date. Several companies (e.g., Fair Issac) currently sell systems that incorporate their proprietary approach to credit screening. Most of these are rule-based systems. In some cases, the rule tables are supplied by the vendor; in other cases, the experience and judgment of local credit officers is built into the tables by a complicated interview/analysis process. Most of the new systems also integrate data from credit reporting services such as TRW into the decision process.

5. Outsourcing

There was strong interest in the early 1990s for the use of downsizing and outsourcing, driven by the need to cut costs and raise capital. Although bank profits have improved at many institutions, there is still pressure to cut costs and counter shrinking margins. Pressure to reduce costs through mergers is also significant.

Consolidations—Late in 1990, Manufacturers Hanover Trust set the pace for cost control through computer operations downsizing by announcing that it would consolidate eight data centers into just two, with major cuts in staff. In recent years, there have been several significant mergers and consolidations of operations, including Manufacturers Hanover and Chemical Bank, Bank of America and Security Pacific, and NCNB and C&S/Sovran. Each of these mergers was based on the same rationale: to consolidate and cut costs. All resulted in significant consolidation and cost savings in the area of branches, operations and headquarters staff. More mergers of this type will take place.

In the 1990s, several very large and many midsized banks have turned to outsourcing. At \$700 million over the life of the contract, the IBM/Continental Bank deal of September 1991 is the largest recorded to date. Other major deals include First Fidelity BankCorp (\$450 million) and Signet Bank (\$300 million).

Although outsourcing will still remain a viable option for small to medium-sized banks that are not large enough to develop and manage leading-edge technology on their own, many of the larger institutions are re-examining the benefits afforded by outsourcing and attempting to achieve some of the same results on their own, using consultants who specialize in data center



consolidations and systems integration. Some larger banks will turn to outsourcing, however, as Chase did before the merger with Chemical.

6. Distributed Systems and Integrated Databases

As in other industries, many banking and finance firms are placing decreasing emphasis on minicomputer-based distribution of information systems functionality and increasing emphasis on client/server networks tied cooperatively into mainframe databases and legacy processing systems.

To support relationship banking, firms are turning to RDBMS technology on client/server systems for implementing comprehensive, relationship-based customer account records. Banks have increasingly come to believe that integrated customer information systems provide competitive advantages by attracting customers (business and personal) with single-statement summaries of financial status.

Similarly, RDBMSs on client/server systems or workstations are the key to implementing the transition from operational automation to strategic, competitively oriented information systems, including executive information systems. However, despite the years of discussion about the advantages of executive information systems, many senior banking executives have yet to endorse the benefits of a carefully crafted executive information system, and IS executives feel that they still have an uphill battle to implement such applications.

7. Workstations/PC Convergence

For many years, high-speed, high-powered workstations have been serving the fast-response, complex needs of specialized brokerage traders, such as those in international currency trading. More recently, such workstations have been used in banking for complex functions such as cash management. These workstations have typically been based on the UNIX operating system.

However, as the PC has evolved in power with new chips such as the Pentium, the PowerPC, and the Alpha, and new, more sophisticated operating system capabilities continue to be developed, the distinctions between PCs and workstations are rapidly eroding. Microsoft has aggressively introduced a specialized set of banking industry interfaces to the Windows operating system, while UNIX developers are expanding the sophistication of their user interfaces. Operating systems themselves are being made more portable, so that users can choose to run a specific operating system/application combination on an ever-widening set of platforms.

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The overriding trend in this arena is that applications and operating systems will continue to consume more power, and there will be a convergence of hardware and operating system capabilities to run any combination of applications required by the user.



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IV

Impact of Trends and Issues on Information Systems

Based on primary-research interviews with selected banking and finance firms, plus secondary research using other industry sources, this chapter examines the major factors driving the information systems (IS) function, outlines how the banking and finance industry uses information systems, and details the key impacts on the use of information services.

A

Global IS Issues

As 1996 begins six key issues, noted in Exhibit IV-1, are influencing the course of information systems in the banking and finance marketplace. One group of issues addresses the structured, planned changes that are occurring in both the industry and the data processing function. These changes, often characterized as "business reengineering," are being driven by industry consolidation, the economy, technology, competition and other pressures. The reengineering process forces individual firms to consider how they currently perform their core business activities, and how they might restructure both internal processes and external relationships to improve their overall performance.

Among other considerations, this analysis forces an evaluation of how and where the IS function is performed, including what portions of it (up to and including the total IS function) can be outsourced. Consolidation of data centers and IS staff previously distributed to individual business units may provide an alternative to outsourcing. Mergers and general budget constraints drive both IS consolidation and general organizational downsizing, as institutions seek to reduce the inherent redundancies of merged organizations and trim the excess resources that accumulate during periods of growth and relative technological stability. Finally, open systems, the Internet and other networking resources are making it easier to become part of the national and global marketplace and take competitive advantage of the many new applications and service offerings.



Exhibit IV-1

**Banking and Finance Marketplace—
Global IS Issues for the 1990s**

- Networking
- Reengineering
- Outsourcing
- Data center consolidation/restructuring
- Downsizing
- Open systems

Source: INPUT

B

IS Applications Environment

The applications environment of the banking and finance industry may be segmented into three categories of systems:

- Generic and cross-industry applications to support standard business functions
- Internal applications to support the institution
- External applications to support specific lines of business

Generic and cross-industry applications used by banking and finance firms are common to all industries, and are described in other INPUT reports. The other categories are industry specific. Exhibit IV-2 provides a representative list of IS applications that are unique to the banking and finance sector.



Exhibit IV-2

Banking and Finance— Representative Industry-Specific IS Applications

Internal Applications

- Banking Infrastructure
 - Branch Automation
 - Customer Information File
 - Financial and Profitability Reporting
- Treasury Management
 - Asset/Liability Management
 - Portfolio Management

External Applications (Product/Service Support)

- Payment/Deposit
 - Check Processing
 - Retail Electronic Transaction (ATM/Debit Card) Processing
 - Deposit Processing
 - Time Deposit Accounting
 - Corporate Treasury Management
- Retail Loan
 - Personal Loans
 - Mortgage Loans
- Credit/Debit Card
- Commercial Loan
 - Corporate Loans
 - Corporate Money Market
- Corporate Trade Finance (Letter of Credit, etc.)
- Trust and Agency
- Brokerage Systems

Source: INPUT

1. Banking Infrastructure

These applications generally support multiple products, services and customer groups, or provide information required to manage the institution.

- *Branch automation* systems support tellers and "platform" (marketing and customer service) staff, providing on-line access to customer records and facilitating administrative tasks such as account opening/maintenance, etc.



- *Customer information files* integrate data from account-oriented processing systems (checking, savings, mortgage loans, etc.) to provide an overall picture of a customer's relationships with the institution.
- *Financial and profitability reporting* applications provide data for internal management to assess institutional performance by customer group, product line, branch, etc.

2. Treasury Management

These applications support the overall control of the institution's financial position.

- *Asset/liability management* systems track the maturity and interest rate profiles of all the institution's assets (loans and securities) and liabilities (deposits) to ensure that they are properly matched.
- *Portfolio management* systems control the institution's portfolio of investment securities (bonds, T-bills, etc.).

3. Payment/Deposit

Payment/deposit applications support all forms of transaction and deposit processing activity—retail and corporate—except credit card transactions.

- *Check processing* includes the physical handling of checks (clearing) and the account maintenance for both retail and corporate customers of all transaction-oriented accounts.
- *Retail electronic transaction processing* covers transactions that are initiated by the consumer through electronic terminal devices.
- *Deposit processing* is the physical handling of deposits, from the single check received over the counter to the armored cars full of checks and cash.
- *Time deposit accounting* includes the entire spectrum of non-transaction deposit products offered by financial institutions, from passbook savings accounts to jumbo CDs and overnight corporate money market deposits.
- *Corporate treasury management* systems allow corporate treasurers to monitor daily account balances, move funds between accounts, and invest/borrow as needed, all via terminals in the treasurer's office.



4. Retail Loan

Retail loan applications fall into two major categories:

- Personal loan processing covers everything except mortgage loans. This includes both unsecured lines of credit and collateralized transactions such as car loans.
- Mortgage loan processing includes all types of fixed and variable rate programs, different forms of collateralization, and the management of loan pools that may be sold in secondary markets.

5. Credit/Debit Card

Such applications include both issuer (cardholder) and acquirer (merchant) processing, including interfaces between banks, processors, networks and associations (Visa, MasterCard).

6. Commercial Loan

Commercial loan applications vary depending on the nature of the lending activity and the associated collateral.

- *Commercial loans* often involve large dollar amounts and complex, customized legal arrangements that require detailed tracking of the borrower's financial status. They may also be syndicated, requiring the "lead" institution to act as a loan servicing agent for the participants that each own a piece of the loan.
- *Corporate money market* activity may involve the bank both as a buyer of commercial paper and as an issuing agent on behalf of its corporate customer.

7. Corporate Trade Finance (Letter of Credit)

These activities include a combination of credit extensions, international payments, and the tracking and analysis of complex documentation.

8. Trust and Agency

Trust and agency activities typically involve the institution acting on behalf of someone else to manage and process funds.



9. Brokerage Systems

Brokerage systems support trading, retail and back-office systems.

C

IS Response to Environmental Forces

1. Overall Cost Reduction Strategies

Some of the strategies pursued by large banks and other financial institutions, either to contain or reduce costs in response to the environmental pressures discussed in Chapter III, are summarized in Exhibit IV-3. In general, these institutions are asking themselves:

- Should we be doing everything we are doing?
- Can we do it cheaper?
- Can someone else do it for less?

Exhibit IV-3

Cost Reduction Strategies Applied by Financial Institutions to the IS Function

- Reduce product development/customization
- Standardize on fewer application systems
- Reduce maintenance expenditures
- Reduce internal DP staff
- Reduce use of outside consultants
- Consolidate networks and data centers
- Outsource applications and/or operations

Source: INPUT

2. Cost/Benefit Analysis

As part of the process of controlling the costs of existing operations, many financial institutions are questioning the basic justification of some previously "sacred" expenditures.

Bank information systems have frequently become costly, competitively driven investments that have not provided either significant competitive advantage or large returns on investment. Consequently, the emphasis for bank investments, now and in the near future, is on demonstrating quantifiable benefits before money is allocated, and then managing the



investments to ensure that benefits are actually achieved. This applies not only to systems, but to all other categories of expenditure as well.

3. Cost-Cutting Efforts

By restricting the scope of systems development and maintenance activities, and concentrating on improving the cost/performance equation in delivering core functionality to users, many finance industry managers have managed to handle ever-increasing transaction volumes while actually decreasing their operating budgets. One of the reasons for this is the constantly improving cost/performance of hardware, coupled with changes in the pricing strategies of software vendors.

Consolidation refers to internal efficiencies, as opposed to those resulting from mergers or acquisitions. Decreases in the use of contract programming, layoffs (and attrition), system standardization and reductions in maintenance expense are cost-control efficiencies that the banking industry found to be prudent in the early 1990s.

These consolidation efforts represent the reversal of an earlier trend toward decentralizing systems responsibility in large organizations to the level of the individual business unit. Though this earlier decentralization provided improved responsiveness to user needs, it also created substantial redundancies, inefficiencies, and interapplication communications problems. The current trend in large organizations is toward corporate development and the use of client/server architecture that supports decentralized business applications development and processing.

4. Outsourcing

As a result of cost consciousness and a desire to return to their core banking business, institutions are continuing to shift functions to processing services or outsourcers. In addition to direct operating-cost benefits, such arrangements generally free bank capital.

Outsourcing varies considerably by function and application. For example, high-cost, capital- and technology-intensive leading edge activities are particularly good candidates for processing services or outsourcing: EDS, Perot Systems, ALLTEL and Fiserv are currently estimated to handle over 50% of the total U.S. check processing volume, and there are fewer than 100 vendors that handle the processing for Visa's 6,000+ U.S. members (banks, S&Ls and credit unions).

ALLTEL (formerly Systematics) has long offered clients a flexible mix of traditional IS outsourcing options, including applications software, processing services, and combined platform/applications management.



5. Downsizing

Banks are taking advantage of increasing mainframe cost/performance and technological advances to downsize from multiple data centers. In addition, many banks are starting to strip away peripheral functions (e.g., data entry, simple queries) from mainframe systems and place them on distributed client/server systems.

In addition to the initial investment, a major obstacle to using the PC environment is that the kinds of operations now on the mainframe, for most midsized and larger banks, cannot yet be handled effectively on the smaller, less powerful platforms.

Current PCs and workstations were not designed to handle the large volume of data (measured in gigabytes) required by the operations of a large bank's check processing operation. Nor did they possess the level of sophistication in operating system and database software required to support complex banking applications. Finally, most of the high-volume peripherals that are integral to core banking functions (such as check-processing systems) have been available only for mainframe attachment. A new class of such systems—designed specifically for use with networked PCs and workstations—will be required before downsized systems can supplant mainframes in banks. There are also significant software limitations to effectively downsizing mainframe applications.

6. Technology

Bank processing systems have historically been developed on a product-line basis, processing individual records for each account on the system. Individual clients may have none, one or many accounts on any given system, and any integration or interface between systems is typically handled by transferring files from one system to another. The early implementations of the Customer Information File (CIF) concept generally relied on just such extracts from individual application files. Loading these extracts into a relational data structure facilitates the kind of integrated account analysis that is required to implement "relationship banking" service levels throughout the organization. Such analysis is useful for routine transaction processing by tellers, credit approval and marketing by platform officers, and other activities such as cross-selling promotions and direct mail campaigns.



7. Disaster Recovery

There is increased regulatory emphasis on disaster recovery, more positively known as contingency planning. This has led processing services firms that specialize in this area to develop new and more sophisticated capabilities to support their clients. Sunguard and Comdisco are leading disaster recovery services vendors.

Among the capabilities offered by such vendors is transaction shadowing for real-time systems, a technique by which transactions processed by the client's data center are simultaneously sent via dedicated communications lines to the disaster recovery center, so that there is immediate backup available for all transactions processed up to the moment of failure. In addition, backup power supplies and alternate communications facilities (e.g., VSAT satellite links) are becoming cheaper and more powerful and flexible, providing easy access to alternative processing sites when the primary processing site is nonfunctional.

The concept of contingency planning has had strong support over the last few years, as an unprecedented number of natural disasters—tornadoes, hurricanes, earthquakes and floods—reinforced the need for and benefits of planning for service and business interruptions. Recent trends in board of director/stockholder relations also indicate that business stakeholders expect company management to be prudent in the protection of assets and business resources and that failure to do so may lead to litigation. Such concerns are especially important in the case of the financial activities in which banks are participants.

D

Impact of New Technologies

Several technologies are affecting the way banking and finance firms design and implement their information systems.

1. RDBMSs

RDBMSs, especially Oracle and IBM's DB/2, are installed at many large and midsized banks. Given the competition for deposits versus money market funds and other nonbank investments, many banks and S&Ls want to emphasize relationship banking, which takes into account *all* of the customer's business with the institution. Relationship banking makes installation of an RDBMS a competitive necessity.



2. Imaging

Imaging, at this point, appears to be the technology that everyone is familiar with and everyone is studying, but few have fully implemented.

Over a decade ago, Amoco pioneered capturing digitized images of customer signatures and notes from its charge slips and printing them on the customer statement. Taking this one step further, American Express pioneered imaging of the entire charge slip record. By contrast, Visa and MasterCard did away with moving paper and started sending electronic data many years ago.

American Express remained a paper-based "country club billing" operation for several reasons:

- Customers supposedly liked it.
- AMEX felt it conveyed a venerable, "upscale" image.
- Unlike the bank cards, AMEX had no financial institution partners to work with in capturing and truncating the drafts.

Now, however, some of these advantages are becoming moot. With the advent of electronic draft capture for small retail transactions and the computer-based interfaces from large merchants, such as Macy's, and travel and entertainment vendors, such as hotels, airlines and rental car companies, most of the "imaged" charge slips on an AMEX bill are simply paper-wasting reproductions of data that could be printed on one or two lines of an itemized statement.

As noted in the previous chapter, the technology supporting item processing imaging applications has not advanced as fast as originally projected. Until this situation improves, item processing imaging systems will be acquired primarily by large institutions with large corporate account bases, where the majority of checks processed are easily readable, computer-generated items. Large service bureau check processors such as EDS and Perot Systems can also be expected to invest in item imaging equipment, thus providing smaller institutions with some of the benefits and marketing advantages of imaged checks (e.g., for retail customers, imaged statements instead of returned checks; for corporate customers, specialized account reconciliation services).

3. EDI

Electronic data interchange, the direct computer-to-computer transfer of information such as orders and deliveries, as well as information about payments, continues to grow steadily outside of the banking sector.



Although all banks routinely use electronic ACH (Automated Clearing House) facilities and wire transfers, few apparently see themselves in future roles as significant EDI intermediaries. This stems from three basic factors:

- The already-entrenched position of EDI service bureau vendors outside banking, and the fact that over 75% of EDI traffic is unrelated to payments
- The fact that the ACH network is not oriented toward handling non-financial information, and the late-emerging capability of the ACH to support detailed remittance advice data
- The complexity and cost of developing the business/systems interface to provide clients with a proper financial EDI interface

4. Workstations

For several years now, high-powered workstations have become the vehicle of choice for traders in banks and brokerage firms to monitor fast-moving financial markets, run complex analytical models, and execute transactions in stocks, money market instruments and financial derivatives. High-powered PCs running OS/2 have also become popular as drivers of funds transfer systems, and for other networked applications. As hardware costs drop and the capabilities of PCs and workstations converge, such applications will proliferate. To date, however, the banking and finance industry has found little other use for standalone workstation technology, and future applications remain unclear.

The main trend in workstation/PC technology seems to be driven by the shift to client/server applications, and the increased use of high-end PCs to support the larger and more complex applications and operating systems overhead required of the networked/client/server/GUI environment.



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Information Services Market Forecast

This chapter identifies the markets for information services in the banking and finance industry.

User expenditure forecasts are provided by industry segment and by product/service sector. Assumptions driving the forecasts are presented. Note that these forecasts do not include functional general-purpose information services, such as those in support of the human resources function, general accounting, or for generic planning and analysis. The markets for these types of information services are presented in INPUT's cross-industry market analysis reports, rather than the industry-specific reports.

Section A, *Overview*, discusses the overall size and growth rate of the banking and finance industry's expenditures for information services.

Section B, *Product / Service Sector Analysis*, segments the market's expenditures into INPUT's seven standard product/service sectors.

Section C, *Industry Segment Analysis*, provides a restatement of this forecast in terms of the major market segments within the banking and finance industry. These segments are:

- Commercial banks
- Savings and loan institutions (S&Ls)
- Credit unions
- Brokerages and other financial services firms



A

Overview

Major business and technical forces that will affect the banking and finance industry's use of information services during the next five years are summarized below.

1. Driving Forces

Telecommunications and the Internet—In addition to lower costs for delivering services, the increasing use of telecommunications and the Internet will change the nature of some services. For example, payment for products sold on the Internet will involve new processes, and therefore, the information systems and services resources to support those processes. As volumes of transactions increase on the Internet for personal and business purchases and other activities, there will be a corresponding increase in the need for structured financial institutional participation in the payment (and other related) processes.

Mergers and Acquisitions—Bank mergers and acquisitions continue to have mixed effects on the various information services delivery modes. In general, any merger is going to cut back on the overall use of standard applications solutions. Although processing services tend to be the hardest hit because of their volume-sensitive pricing, vendors in all service categories can suffer in mergers. In the case of applications solutions and processing support services (processing services, turnkey systems, applications software and outsourcing), an acquiring bank is likely to cancel the outsourcing arrangements of its new subsidiaries and assume responsibility for this processing. Indeed, the reduction in combined processing costs is one of the typical justifications for these mergers.

The beneficiaries of merger activity are primarily firms that can provide specific assistance to the acquiring company in managing the integration of the target banks into their new parent. If new systems are needed, bank applications software vendors may see acquiring banks choosing to buy rather than build new and larger systems. Professional services firms and systems integrators will see the merging banks reach out for advice on systems modification or evolution and for full-scale contracts to integrate old and new systems. Also, outsourcing vendors should keep a watchful eye on mergers to identify ripe opportunities to sell the advantages of outsourcing the expanded systems department functions.

Competition—Nonbank financial services firms will continue to be in relatively strong competitive positions (versus the traditional banking industry) in the near future, unless now-unforeseen new banklike regulations are imposed. Many nonbanks are already strong users of



network services, and act as both users and providers of processing services for credit card authorization and transaction processing. Nonbanks will prove to be good customers for:

- Banking applications software adapted to their specific needs
- Professional services to help nonbanks modify software or build custom systems to meet their unique needs
- Integration of expensive and complex new technologies (perhaps even imaging, which nonbanks can better afford than banks can, as demonstrated by American Express) into their systems
- Resources that contribute to operating environments in a cost-efficient fashion—to keep data processing costs stable, even in the face of growing business and systems requirements

Turnkey System Price/Performance—A different product/service sector—turnkey systems—is benefiting from recent price/performance advances in UNIX systems and the increased sophistication and performance of PC-based systems. These advances allow many turnkey vendors to offer small and midsized financial institutions significant power for in-house processing at much better hardware prices than in the past. Note, however, that such turnkey business often will come at the expense of the processing services on which such users relied in the past. In the most basic sense, it is this attractively priced in-house processing resource that is driving the "insourcing" trend for small and midsized banks.

RDBMSs—Many commercial banks and S&Ls are finding RDBMSs an appropriate technology to address two key issues: the competitive need to implement relationship banking (which ties together records of all a customer's accounts) and the need to integrate multiple systems and records in the current wave of banking industry mergers. Vendors of the basic RDBMS software environments and of the add-on software packages that extend RDBMS functionality—especially those that work with IBM's DB/2 and Oracle—are seeing such new opportunities.

Regulatory Compliance—The large number of small to medium-sized commercial banks and S&Ls are being driven harder and harder to maintain their systems' compliance with fast-changing banking regulations and reporting requirements. Packaged applications software vendors, processing services vendors, and outsourcers all can point out that they offer a central, economical approach to keeping the institution up to date—and in legal compliance—with such changes, so that banks can concentrate on the banking business.



2. Inhibiting Forces

In contrast, a number of forces, discussed below, are inhibiting banking and finance firms' use of information services.

Overcapacity and Product / Service Sector Trade-offs—The industry continues to suffer from two kinds of overcapacity: too many institutions, and too many facilities. It is obvious that the current trend toward commercial bank consolidations will continue as long as regulatory authorities will allow, boosted by already established timetables for breaking down barriers to interstate banking. Although specific opportunities will emerge from this downsizing of the industry, the absolute number of sales prospects for information services vendors will drop. Meanwhile, competition for their business will increase as users are presented with a greater variety of options for standardized application solutions.

Securities Industry—The brokerage firms still represent the industry wild card. Although the market's performance has been highly satisfactory in terms of both price levels (a Dow of 5,000+ would have been unthinkable a few years ago) and volumes for the past several years, many view the future shape of the brokerage business as questionable. Although another long-term expansion and bull market will come sooner or later, the strong trend toward book-entry securities will continue to reduce back-office employment in brokerages. Brokerage management will remain cautious for some time and, following the example of credit cards, more of the brokerage industry's transaction processing may be outsourced to large vendors with significant economies of scale.

Nonbanks—Similarly, nonbank financial services firms—some affiliated with major industrial firms and some diversified only in financial services—represent another uncertainty for information services firms. Historically, nonbanks have strongly favored in-house solutions, including building their own software rather than buying packages. As noted earlier, nonbanks tend to be larger institutions that generally have more money available for investment in information technology than commercial banks and S&Ls. Some, notably American Express, have been pioneers. Moreover, there are a growing number of cases in which outside information services vendors have successfully penetrated this market and maintained profitable, ongoing relationships.

Uncertainty—The uncertainty factor is hardest to deal with. The overall impact of defense cutbacks and base closings, restructuring and cutbacks in the federal government—both ongoing and as an attempt to balance the federal budget in 1995 and the 1996 election year—and the possible revamping of the nation's health care system, is still anyone's guess. However, it is clear that these effects will not be uniformly distributed across

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that this is essential for ensuring transparency and accountability in the organization's operations.

2. The second part of the document outlines the various methods and tools used to collect and analyze data. It highlights the need for consistent data collection procedures and the use of advanced analytical techniques to derive meaningful insights from the data.

3. The third part of the document focuses on the role of technology in data management and analysis. It discusses how modern software solutions can streamline data collection, storage, and processing, thereby improving efficiency and accuracy.

4. The fourth part of the document addresses the challenges associated with data management, such as data quality, security, and privacy. It provides strategies to mitigate these risks and ensure that the data remains reliable and secure throughout its lifecycle.

5. The fifth part of the document concludes by summarizing the key findings and recommendations. It stresses the importance of a data-driven approach in decision-making and the need for continuous monitoring and improvement of the data management process.

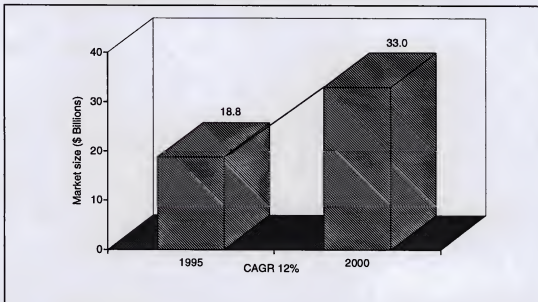
the country. And to the extent that banks are located in troubled areas, or have portfolios concentrated in troubled industries, the effects will vary considerably from institution to institution.

With the future directions of the overall economy, and banking in particular still in doubt—although generally regarded as being positive, or at worst flat for the next few years—caution by bankers can be expected to limit changes in how they manage internal information systems and contract for outside information services. Vendors, in turn, need to be flexible in considering various scenarios and business planning frameworks.

Based on these driving and inhibiting forces, and other factors detailed below, INPUT projects the 1995-2000 information services market for the banking and finance industry as shown in Exhibit V-1. As noted, INPUT forecasts that the overall expenditures in this market will expand from slightly less than \$18.8 billion in 1995 to more than \$33 billion by 2000.

Exhibit V-1

**Banking and Finance
Information Services Market Forecast, 1995-2000**



Source: INPUT

Year-by-year detail is shown in the forecast database (Appendix A). In addition to the driving and inhibiting forces discussed above and the product/service sector-specific trends outlined in the next section, a number of industry segment-based trends are at work behind this forecast.

For example, some commercial banks may represent short-term growth markets for processing services and systems operations, for the reasons detailed earlier. S&Ls, however, may need to convert their business to new



applications software products or processing services in order to remain viable.

Credit unions are already strong users of processing services, and little change is expected.

For year-to-year growth rates, there is a general assumption that past uncertainty regarding the future of the economy and the banking industry will be replaced with cautious optimism over the next several years. This scenario is reinforced by the recent strong performance of many bank stocks. Regulatory changes will be made, consolidation and new ownership patterns will continue, and the re-establishment of stable banking industry operating conditions will lead to a period of renewed growth in the banking and finance sector.

B

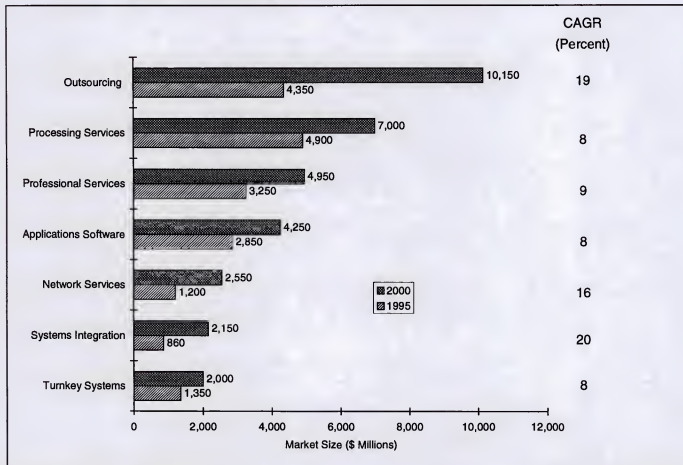
Product/Service Sector Analysis

As shown in Exhibit V-2, there are significant differences projected in the five-year growth rates for the information services product/service categories serving the banking and finance industry. Forecast assumptions by category are noted in the following paragraphs.



Exhibit V-2

**Banking and Finance
Market Forecast by Product/Service Category, 1995-2000**



Note: numbers have been rounded

Source: INPUT

1. Professional Services

Expenditure for professional services by the banking and finance industry is strongest, historically, in the area of contract programmers and other consultants who can satisfy specific programming and systems needs on a relatively short-term, project-oriented basis. There has also been secondary use of consultants for services such as overall systems evaluation, overviews of technologies and new technical options, and assistance in reengineering business operations in the largest banks, brokerages, and nonbank financial institutions. Professional services resources can also aid in bank consolidations. Larger institutions make significant use of strategic and IT consulting.

The trend shown for the use of professional services reflects continued emphasis on cost control. In this atmosphere, reductions may be made in



house staff. Also, despite the continuing rapid pace of change in information technologies, the smaller cash-strapped institutions generally will not pay for noncritical technology consulting in the short term. Even the largest banks and nonbank financial services firms—of which there are relatively few—will likely be conservative regarding expenditure for noncritical projects.

As institutions try to reduce overall staffing levels while still retaining the "best and the brightest," there is also a move to outsource the maintenance work on old (legacy) systems while giving in-house staff the opportunity to work with newer technologies and applications. Toward the end of the forecast period, an increase in the rate of institutional consolidation should create additional opportunities for professional services firms to consult with the acquiring firms on systems expansion and/or consolidation.

An example of the benefits of using in-house versus outside resources to address an activity is the "Year 2000 Problem." This euphemism refers to the fact that much of financial institutions' (and business' in general) legacy applications software, especially COBOL code, has imbedded date fields with the first two digits either hard-coded or assumed to be 19. With calculations involving the year 2000, these applications may no longer function properly. Companies such as Computer Horizons and CAP Gemini America have developed sophisticated and complete solutions to the year 2000 issue, and offer analysis, conversion, testing, upgrades (if desired), and implementation services that free internal staff to continue with mission-critical projects while the information services vendor performs the one-time conversion activities.

2. Systems Integration

The systems integration market is closely related to that of professional services. The key distinction between professional services consulting and systems integration is who bears the ultimate responsibility for planning and managing a systems installation project. Consulting firms typically provide analytical or technical support as professional services to their clients, and seldom bear responsibility for the result of an implementation project. Systems integrators, in contrast, act as the general contractor on a systems project, assume project management responsibility, and generally bear some financial risk for the success of the project.

The complexity of today's information systems and services technologies and the rapid pace of technological change make it increasingly difficult to manage large-scale development projects—especially projects requiring a combination of in-house and outside resources.

In merger situations, in-house staff may be unfamiliar with the systems environment of their new partner and inexperienced with the specific



problems of integrating or linking the partner's systems with their own. In addition to supplying management expertise, systems integrators typically provide a variety of proprietary tools and techniques that facilitate the technical task of integrating these multiple system environments.

The services of systems integration (SI) firms will be increasingly important to guide newly merged commercial banks through the complexities of systems consolidation, the implementation of client/server systems, and the linking of new technology systems to old legacy systems. In part, the larger size of the merged organization—especially when there have been multiple, successive takeovers by one institution—eventually should drive many to cost-justifying larger in-house systems (with or without new technologies such as imaging) that systems integrators can help set up.

Strong and aggressive nonbank financial services firms are expected to make continuing large systems investments, providing some specific niche opportunities for systems integration firms. However, as these firms are relatively few in number, their impact on this market will be relatively small.

All of these conditions will drive the SI segment of the banking and financial services sector at a 20% growth rate over the next five years—from more than \$850 million in 1995 to almost \$2.15 billion in 2000—the highest of all sector product/service markets.

3. Outsourcing

Along with processing services vendors, outsourcers have benefited from the banking industry's recent efforts to cope with low profitability and regulatory requirements for higher capital ratios. A systems operator often offers to purchase a capital-consuming in-house data processing operation and guarantee the bank or S&L yearly savings over the course of a multiyear contract. Over the forecast period, this combination will continue to outweigh the institution's natural hesitation to give up corporate control of a key business resource. This trend is reflected in the aggressive 19% growth rate forecast for this product/service category, a rate that will drive the market to more than \$10 billion by the year 2000. The strongest growth will be seen in the areas of business operations, network management, desktop services and applications management.

Note, however, that credit unions (which have few in-house systems) and nonbank financial services firms (which have few regulatory requirements and generally higher profitability levels) are largely exempt from such dynamics.



4. Processing Services

Use of processing services has been strong relative to that of other industry sectors. Such use has always been heaviest by smaller and midsized commercial banks, S&Ls, and credit unions. However, during the forecast period, some commercial banks and S&Ls will merge into larger banks, which generally can be expected to bring processing services in-house for consolidated economies of scale or current processing services to outsourcing contracts.

Aside from merger-related factors, cost-related issues will be a significant determinant of processing services use. There will be some use of processing services by commercial banks and S&Ls of all sizes to redeploy capital away from in-house systems and toward meeting higher capital-ratio requirements. However, there will be a countertrend whereby some midsized and small commercial banks and S&Ls will find turnkey systems to be an increasingly cost-effective alternative to outside processing services' usage-based charges. This countertrend will be most important when the bank or S&L is growing, however—and not when capital is short.

There will be a constant increase in the use of credit cards and debit cards for all types of transactions—traditional merchant sales, ATMs, POS, etc. At the same time, there will be an even greater increase in transaction volumes for third-party card processing services, which will continue to enjoy highly competitive economies of scale and continue to acquire the portfolios and processing responsibilities of banks and other card issuers. Another activity with similar economies of scale is check processing, an area in which two vendors currently have over 50% of the total U.S. transaction volume.

All brokerage firms are heavy users of network services to deliver stock quotes, news, etc., to brokers and traders. The majority of terminals on brokers' desks are supplied by the large quote vendors such as ADP and ILLX. In addition, many smaller brokerages are heavy users of processing services, serving essentially as marketing and research organizations and outsourcing their back-office operations. With the trend toward elimination of stock certificates and back-office paperwork, an increasing number of small and medium-sized brokerages are likely to turn to outsourcing of their transaction processing operations.

Nonbank financial services firms typically have not been heavy users of processing services, and no change is expected in this pattern. However, for all types of financial institutions, increased focus on disaster recovery should increase the demand for backup services, including the associated testing and training needed to ensure the effectiveness of the backup plan.

Responding to the opposing pressures noted above, processing services is forecast to grow at a moderate 8% through the year 2000, when, at more



than \$7 billion, it will be the second largest product/service market in the banking and finance sector.

5. Network Services

Banking and finance industry firms generally are significant users of network services, especially for value-added data communication services and to a lesser extent for electronically accessed information services. The main use of network services is by banks and nonbank credit card issuers and processors. Banks and other processors handle both sides of a purchase or ATM transaction, often through value-added access to networks such as Visa, MasterCard, Plus, etc., via packet network services such as BT Tymnet and Sprint's Telenet.

Banking institutions and nonbank financial institutions are also heavy users of network-based credit reporting services, especially from giants such as TRW and Equifax.

Brokerages use on-line information sources—such as market quotation or information services like Quotron and Reuters—for regular or occasional access to multiple specialized information feeds to meet specific trading needs.

The Internet—The impact of the Internet on current banking and finance industry expenditures is minimal, when considering the other categories of spending activity, noted above, for network services. However, in a recent INPUT survey, more than half the respondents indicated that they used the Internet for electronic mail and had a Web presence to offer information on their financial products. A high Internet impact area identified was customer service, where more institutional information could be accessed more easily by customers. Respondents expect the Internet to help reduce communications costs, thereby increasing profits, but see current limitations in the lack of expected security and a perceived difficulty of use.

These limitations will diminish over the next few years, as people become more "Internet literate," financial institutions better determine which application areas offer the greatest opportunity, and technology and demand resolve perceived impediments to use.

The network services market will grow from almost \$1.2 billion in 1995 to more than \$2.5 billion by 2000—a strong compound annual growth rate (CAGR) of 16%. As the specific applications potential for the Internet becomes clearer, this growth will increase.

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6. Applications Software Products

The banking and finance industry has always made substantial use of packaged software products, especially among the high proportion of small and midsized institutions. Generally, only the largest firms have developed the bulk of their own software systems. Many standard packages are offered, although these often require modification to meet a particular bank's needs. Modification can occur in two ways, with no particular pattern except size of institution: smaller firms generally contract to the vendor or a third-party consultant (sometimes a small local contractor); larger firms use their in-house information systems staff.

To date, PC-based banking software products (except for spreadsheet-type utilities) have generally been restricted to specific departmental applications. There are few PC-based software systems robust enough to meet the high-volume transaction needs of most central banking functions. Sophisticated capabilities for security, rollback/recovery, distributed data entry, etc.—all required and available as standard database and operating system services in the mainframe/mini world—are still generally unknown on PCs. In addition, few of the key volume-based banking peripherals are available for PC attachment. Mainframes and minicomputers have been the rule for integrated core systems, although this rule is changing with continued advances in the power and sophistication of PC-based operating systems and databases.

Mergers and acquisitions are having a significant impact on the software market. In general, acquiring banks do not purchase new applications software as part of a merger. Instead, they usually merge operations of the two institutions onto one platform using existing software packages. Although sometimes this may be on one of the acquiree's systems, it is typically on the (larger) acquirer's system. As a result, existing software licenses are canceled.

In the short term, bankers increasingly will try to make do with existing systems except where competitive pressures—such as for RDBMS-based support of relationship banking—require new software investments. Later, advances in PC power—CPUs, disk drives, operating systems, databases, and high-transaction-rate peripherals—will lead to a new generation of PC-based software applications that will continue the steady workstation/PC applications software growth, while mainframe and minicomputer expenditures diminish slightly.

The applications software market will grow at a steady 8% CAGR from 1995 to 2000, from almost \$2.9 billion to nearly \$4.3 billion.



7. Turnkey Systems

By bundling the required hardware and software into a single package, turnkey systems provide an easy-to-implement solution for many midsized and community commercial banks and S&Ls. This solution is at the price, of course, of generally providing less flexibility for users, thus placing them more at the mercy of the turnkey vendor. Turnkey systems do, however, generally provide the user with more flexibility than some processing services vendors' "one-service-fits-all" approach.

Whether the turnkey application is functionally oriented (e.g., mortgage processing) or a full-scale integrated package, the vendor typically supplies documentation and training as part of the contract, provides continuing updates that maintain regulatory compliance and allow clients to provide competitive new financial products and services as they enter the market, and may also modify the basic system to meet client-specific requirements. This frees the smaller institutions from the impossible task of competing on the basis of technology, and allows them to focus instead on marketing and customer service.

The continuing use of turnkey systems is driven primarily by a new generation of minicomputer- and client/server-based systems for banks and S&Ls. These systems may offer cost-effective alternatives to outside processing services, especially for growing institutions wishing to avoid the use-sensitive transaction costs inherent in a processing service. Perhaps in-house systems may also increase the level of control available to user organizations. In most turnkey environments, the software products are, of course, the key focus, and the customer can choose from multiple platform alternatives.

These attributes are reflected in the 8% CAGR forecast for this product/service category, with market sizes of almost \$1.4 billion in 1995 and more than \$2 billion in 2000.

C

Industry Segment Analysis

In Chapter II, the banking and finance sector was segmented into commercial banks, savings institutions, credit unions, and brokerages and other financial services firms. Exhibit V-3 provides INPUT's forecast of information services spending for the segments of the banking and finance sector for 1995 and 2000. The percentage columns provide an estimate of relative market size, and the CAGR indicates five-year growth.



Exhibit V-3

Industry Segment Markets, 1995 and 2000

Industry Segment	1995 (\$ M)	Percent	2000 (\$ M)	Percent	1995-00 CAGR
Commercial Banks	10.2	54%	19.1	58%	13%
Savings Institutions	3.2	17%	5.0	15%	9%
Credit Unions	2.6	14%	3.6	11%	7%
Brokerages and Other Fin. Inst.	2.8	15%	5.3	16%	14%
TOTAL	18.8	100%	33.0	100%	12%

Source: INPUT

Several disparate factors are driving the growth rates in information services spending by each of the market segments in the banking and finance sector. The relatively high growth and increasing proportion of the overall information services expenditures by the commercial banking sector is tied to the sector's ability to leverage systems operations and systems integration offerings. These faster growing delivery modes are primarily driven by the medium-sized and larger banking institutions.

Brokerages and other financial services firms show a relatively steady but slightly lower growth rate than commercial banks. Brokerages, although they have emerged from the relative stagnation that persisted for years after the 1987 crash, are still operating cautiously in a market that began strong growth again in 1995, but, at a Dow of more than 5000, is now causing observers to (again) predict major corrections that could see drops in overall market value of up to 20%. Trades are conducted whether markets are going up or down, however, and the brokerage industry seems at its most stable state in a number of years.

Savings institutions and credit unions will see lower growth and a declining proportion of expenditures in the information services sector. These smaller institutions will be able to leverage the lower costs of client/server technology or stay with processing services and turnkey systems offerings.

- For credit unions, INPUT assumes that no restrictive legislation to limit their low-cost popularity will be passed as part of federal banking regulatory reform. Enactment of such restrictions would, of course, shift these organizations to an even lower growth path.



- For savings and loans, the overall growth in information services expenditures will be modest, as some institutions will be merged and the remainder will fall back to a slow growth trajectory.



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VI

Competitive Environment

This chapter presents an analysis of the competitive climate for information services vendors to the banking and finance market sector and provides a partial listing of participating vendors and the product/service categories they offer. Three leading vendors are profiled.

A

Competitive Climate

The banking and finance industry sector is comprised of many diverse financial institutions (banks, S&Ls, and specialized institutions); thus, information services firms are presented with a number of different target markets for their product and service offerings.

Yet, despite the large number of financial institutions that conduct business within the U.S., the industry is dominated by a relatively small number of companies. As mentioned earlier in this study, approximately 70% of the nation's bank deposits are controlled by only 3% of the banks. As a result of this oligarchic tendency, competition between information services firms for the top-tier accounts is extremely aggressive.

Business strategies developed by the information services firms that compete in the banking and finance industry are, in part, influenced by the following factors:

- Many midsized and large institutions still conduct some internal and external IS functions on mainframe computers due to the difficulty of moving large databases and associated applications to a workstation/PC environment.



- Small and midsized banks, in an effort to compete against large regional banks, are investigating the benefits of personal computer-based cash management systems, rather than expensive mainframe upgrades. Features offered by these systems include direct deposit of payroll for small business users, transfer of funds, and automated account reconciliation.
- There is increasing electronic interaction between banks/financial institutions and their clients. But many customer files are neither on-line accessible nor centrally controlled.
- Financial institutions are evaluating their workflow processes and are looking to imaging technology to reduce the paper flow and increase productivity.
- Almost all organizations are examining IS outsourcing as a method of controlling expenditures.
- IS budgets are closely monitored and management is looking for measurable return on investment.

B

Participating Vendors

A wide variety and large number of information services firms serve the banking and finance industry, without any overall pattern of dominance or concentration of market control. However, in some specific market niches, a small number of vendors do control most of the business. In check processing for example, EDS, Perot Systems, Fiserv and together are involved with more than 60% of the market.

Leading vendors are often banking-industry specialists, such as Hogan and Jack Henry, yet many multi-industry vendors such as IBM and EDS also compete intensely for market share. Exhibit VI-1 presents a partial listing of IS firms correlated with areas of business.



Exhibit VI-1

Company Segmentation by Product/Service Delivery Mode

Company Name	Network Svcs.	Processing Svcs.	Professional Svcs.	Systems Integr.	Outsourcing	App. SW
Andersen Consulting			X	X	X	X
Dow Jones	X					X
EDS	X	X	X	X	X	
Fiserv					X	X
IBM	X	X	X	X	X	X
M&I Data Services		X			X	X
Mellon Bank Corp.					X	X
NCR/AT&T	X	X	X	X	X	X
UNISYS			X	X	X	X

Source: INPUT

However, there are patterns in the kinds of services offered by vendors, based upon the size of the target institution and the nature of the application area supported. For example, most turnkey vendors are small firms targeting specific niche markets. In the mortgage processing area, laptop computers for loan origination and file folder imaging systems for back-office processing are significant turnkey markets. In the brokerage field, trader workstations with built-in analytic and display software are an important turnkey segment.

Processing services continues to be an area of increasing vendor concentration, due to the economies of scale in both operations and application development and maintenance. Full-service contracts, for which a vendor handles all of the client's processing, are typically associated with the very large number of small institutions (less than \$50 million in assets).

Applications software and professional services are provided—and purchased—by firms of all sizes. Again, the smaller vendors are in function-or-product-specific niche markets, whereas the larger vendors provide more global support in both applications suites and categories of service.

Systems integration and outsourcing services are usually found in the larger vendor and client companies, although more midsized institutions will probably start to use systems integration services to develop and implement new client/server applications. Outsourcing vendors often have guidelines that suggest a minimum asset base of \$250 million before an outsourcing contract is worthwhile.



Electronic information services are provided by only a few large vendors, but are used by institutions of many sizes and types. In general, the vendors specialize by type of information provided, and the usage is a function of the client's overall size and business volume.

Exhibit VI-2 offers a list of leading vendors to the banking and finance sector and their 1995 estimated market share.

Exhibit VI-2

1995 Information Services Market Share (Estimated)

Company	Market Share (Percent)
First Data Corporation/First Financial	8
IBM	7
EDS	6
Fiserv	3
ADP	2-3
Andersen Consulting	2-3
Unisys	2
Dow Jones	2
DST Systems	1-2

Source: INPUT

In summary, competition is intense for the business within an industry sector that includes many smaller and mid-sized institutions that make extensive use of information services. Many of the larger vendors provide a variety of services so that they can support clients of any size, or provide a full range of applications support so they can support all the needs of any given client.

C

Leading Vendor Profiles

In addition to the existing, large "traditional" vendors of banking and finance sector products and services identified above, it is important to identify smaller and emerging vendors, particularly those that are also able to assist banks with electronic commerce, on-line banking services and Internet-related services. (Note that some vendors may be capable of competing with banks in selected financial areas. Such vendors include Cybercash, First Virtual, Intuit, MCI, Microsoft, Netscape, Oracle, UUNET and Verifone.)



Three of the larger vendors, with a broad range of products and services, are briefly profiled below. They are Affiliated Computer Services, Inc., the BISYS Group, Inc., and M&I Data Services, Inc. More detailed profiles are available from INPUT's Vendor Analysis Program (VAP) for many information services vendors to this market sector.

1. Affiliated Computer Services, Inc.

2828 North Haskell
P.O. Box 219002
Dallas, TX 75204
Phone: (214) 841-6111
Total Employees: 3,000
Total Revenue: \$313,000,000
Fiscal Year End: 6/30/95

a. Background

Affiliated Computer Services (ACS) provides a broad range of information processing services to financial, commercial and government institutions operating in time-sensitive businesses.

- The company has three principal lines of business: Financial Services, Commercial Services and Records Management.
- Services include data processing, network management services, systems integration, electronic funds transfer, electronic benefits transfer processing, facilities management, automated teller machine (ATM) support and maintenance and records management services.
- ACS also provides business forms and office products through Precept, a wholly owned subsidiary.

ACS's strategy is to generate recurring revenue by developing long-term relationships with customers that outsource information processing and records management services.

b. Financial Services

ACS Financial Services provides a range of processing services to financial and government institutions through five business units as follows:

- Core Data Processing
- EFT Processing



- Securities Processing
- Hardware Field Services
- Electronic Benefits Transfer

Core Data Processing—Included in Core Data Processing Services are three product lines: Advantage, Dimension 4000 and Premier Platform.

Electronic Funds Transfer Services—ACS uses its MoneyMaker™ ATM/POS product to process its clients' electronic funds transfer (EFT) requirements.

ACS also offers the Tidel AnyCard ATM system, a script terminal featuring timed access cash controllers. Retail point-of-sale (POS) services include credit and debit authorization, electronic draft capture, ACH debit, check verification and reporting and settlement.

Securities Processing Services—ACS Financial and Securities Services provides specialized processing to the financial community. Applications offered include:

Hardware Field Services—ACS/Field Electronics is a third-party maintenance company that provides first- and second-line hardware maintenance, including board-level repair on ATM devices, such as the MoneyMaker network's ATMs. Maintenance is provided for all major brands of ATMs—Burroughs, Docutel, Diebold, IBM, NCR and Fujitsu. ACS/Field Electronics also provides cash replenishment services.

Electronic Benefits Transfer Services—ACS currently provides full-service, on-line electronic benefits transfer (EBT) processing services for government agency programs such as Food Stamps, Aid to Families with Dependent Children, Unemployment Insurance, Medicaid, Child Support, Social Security, Supplemental Security Income and General Public Assistance.

ACCEPT, ACS's electronic benefit distribution system, permits electronic delivery of cash and medical services benefits through ATMs, POS and debit/credit terminals, or by direct deposit into individual accounts.

c. Key Points

Key challenges for ACS include:

- Making the transition from a utility/facilities management processor to a value-added outsourcer



- Differentiating itself from a significant number of large competitors in the banking and finance and health care industries
- Continuing to build on functional outsourcing opportunities, including its MoneyMaker ATM and EFT customer base of retailers and entertainment industry customers

Aggressive acquisition of companies has positioned ACS to expand into various vertical industries and to bid on larger contracts against its major competitors.

ACS is positioning itself as an outsourcing vendor able to offer a broad range of services, including records management. This may gain ACS add-on business with existing clients as well as demonstrating the experience needed to attract new clients.

2. The BISYS Group, Inc

150 Clove Road
Little Falls, NJ 07424
Phone: (201) 812-8600
Total Employees: 1,000
Total Revenue: \$201,000,000
Fiscal Year End: 6/30/95

a. Background

The BISYS Group, Inc. (BISYS) is a major third-party provider of transaction processing and related services to the financial services industry.

BISYS was organized in August 1989 to acquire certain banking and thrift data processing operations from Automatic Data Processing, Inc. (ADP). Together with its predecessors, BISYS has been providing processing services for over 25 years.

- The company's principal services are provided to commercial banks and thrifts through its TOTALPLUS™ IBM mainframe-based processing service.
- As the result of several acquisitions, BISYS also provides loan administration and servicing for a range of real estate and consumer loans to various types of financial organizations; item and currency processing services to banks and retail organizations; 401(k) marketing support, administration, and record-keeping services; and administrative distribution, marketing, fund accounting and transfer agency services for proprietary mutual funds, primarily to banks.



b. Financial Services

Services are provided to BISYS' clients, for the most part, on the basis of multiyear contracts that renew for successive terms, unless terminated by either party. The fee structure is based on the number of accounts, loans, participants and/or transactions handled for each service, subject to minimum monthly charges, plus additional charges for special options and features.

Information Services Division—BISYS' TOTALPLUS system supports all aspects of a bank's automated requirements related to its operations, customer management, and product distribution functions through proprietary central-site and client-site computing.

BISYS Document Processing, Inc. (formerly JRS) provides check processing and back-office outsourcing, including deposit processing, statement rendering, lockbox and return-item distribution of checks, share drafts, money orders and gift certificates.

A disaster recovery system, key restoration services (including off-site storage and rotation of critical files), a third-party hot site and telecommunication recovery capabilities are also available.

Through BISYS Survey, the Information Services Division provides loan and deposit interest rate information on products offered by banks, thrifts and credit unions on a daily, weekly or monthly basis.

Loan Services Division—BISYS provides nationwide loan services outsourcing through its Litton and TSSI subsidiaries to financial institutions, insurance companies, private investors, and U.S. government agencies.

Investment Services Division—This division was established in July 1993 with the acquisition of Barclay.

Barclay provides 401(k) administrative and record-keeping services to over 2,200 corporate clients throughout the U.S.

c. Key Points

BISYS' objectives are to increase the number of its financial organization and other clients and to expand the services it offers them. The company's current strategy to attain these objectives is to:

- Be the single source for automated solutions for its clients' operations, customer management, decision support and product distribution functions

[The text on this page is extremely faint and illegible. It appears to be a multi-paragraph document, possibly a letter or a report, with several lines of text visible but not readable.]

- Pursue balanced growth, both internal and external
- Attract new clients, having dedicated and invested resources in a national direct sales force and marketing support
- Cross-sell services, offering and developing central and client-site products and complementary services marketed to existing and new clients
- Seek strategic acquisitions
- Maximize recurring revenues through long-term contracts and focused account management
- Form strategic business partnerships

As of June 30, 1995, BISYS had approximately 1,000 employees, including Barclay and BISYS Survey. The company currently has about 1,100 employees.

3. M&I Data Services, Inc

770 North Water Street

Milwaukee, WI 53202

Phone: (800) 822-6758

Total Employees: 3,000 (Estimated)

Total Revenue: \$300,000,000 (Estimated)

Noncaptive Revenue: \$240,000,000 (Estimated)

Fiscal Year End: 12/31/94

a. Background

M&I provides processing services, outsourcing services, and applications software products primarily to banks and thrifts. M&I also provides processing services to affiliates of its parent, Marshall & Ilsley Corporation, a diversified interstate bank holding company.

M&I was formed in 1964 as the processing services arm for Marshall & Ilsley correspondent banks in the state of Wisconsin. In 1982, the company began providing processing services to financial institutions outside of Wisconsin.

In 1986, M&I officially became a wholly owned subsidiary of Marshall & Ilsley Corporation.



b. Financial Services

M&I provides a range of processing/systems operations services to over 500 banks, savings and loans and savings banks in 41 states, with 198 remote sites and assets ranging from \$2 million to \$13 billion. M&I manages a network of over 57,000 CRTs, PCs and printers, and 3,000 EFT terminals.

M&I offers six delivery options for its products and services as follows:

- **Service Bureau**—Traditional remote computing processing services are provided that allow a financial institution to access M&I's data center for the applications it needs. M&I maintains the technical infrastructure and provides product and customer support.
- **Premium Service Bureau**—M&I provides a customized version of M&I's Integrated Banking System (IBS) for the client, run at an M&I data center. In addition, the client receives special programming services and dedicated product support.
- **Resource Management**—For this service, M&I manages selected data processing resources for the customer. This may include M&I and non-M&I software, people, and/or technical environment.
- **Facilities Management**—M&I manages the entire data processing function for the customer at the customer's facility.
- **Remote Compute Utility**—M&I software is purchased by the customer. M&I provides operations and support at an M&I data center until the client's experience level and hardware configurations permit processing in-house.
- **Software**—M&I IBS software is purchased and run on the customer's mainframe. M&I Trust System and Custom Statement Formatter (CSF) software may also be purchased and run on the customer's IBM or compatible mainframe.



M&I applications available via processing/systems operations services include the following:

- Customer Information System (IBS)
- Financial Control System
- Deposit System (IBS)
- Loan System (IBS)
- Customer Profitability System (IBS)
- MICARD Services for bankcard processing
- MICASH for corporate cash management
- MIPATH for electronic funds transfer
- Teller/Platform Systems (IBS)
- Teller Card Link
- Custom Statement Formatter
- Trust System
- ExecuVision

M&I also offers the INFO Center, a series of products used by processing clients to retrieve, manipulate, analyze and present data, and bulk filing services.

M&I also provides applications software products for IBM and compatible mainframes.

c. Key Points

M&I is focusing its resources on the following objectives:

- Increased ease of use and decreased cost of use, resulting in greater efficiency for its customers
- Innovative products offering competitive advantages to its customers
- Flexibility to allow customers to adapt to changing financial industry conditions

M&I intends to capitalize on changes in the market, including:

- The trend for ever-larger companies to outsource



- The trend toward open operating systems like UNIX and Windows. M&I is now using a new technology that enables existing software to run on lower-cost PC workstations.
- The trend toward plastic instead of paper, with new products like Visa and MasterCard debit cards. M&I's EFT service, which provides support for ATM systems nationwide, has been very successful.
- The continued and increasing demand for innovative software



VII

Conclusions and Recommendations

A**Conclusions**

The banking and finance industry is generally healthy, becoming global in scope and going on-line. Bank consolidations will continue at an accelerated pace, with the big getting bigger, but new banks—especially one-branch institutions that target specific markets—will continue to enter the market.

Banks that are interested in expanding the scope and nature of the services they provide are already seeing increased opportunities as a result of the new Interstate Banking and Branching Law of 1994 that allows bank holding companies to acquire or establish subsidiary banks in any state. In 1997, this legislation will also allow banks to merge across state lines (with some restrictions). Banks may also soon be able to offer insurance, brokerage services and other banking activities, in addition to their expanded geographic capabilities.

Consolidations will continue, yielding opportunities for systems integrators. Outsourcing will also be actively embraced by more banks as they seek improved profitability and higher capital ratios. Network services will continue to be driven by the communications needs of the industry, with the Internet offering the potential for a presence delivering not only inquiry services, but also easy, ubiquitous access for financial transactions.

Nonbanks, such as subsidiaries of American Express and GE, are providing more and more consumer-oriented financial services, including electronic commerce over the Internet, PC-based payment and transfer services and EDI payments for commercial ordering and distribution systems.

The balance of this decade will be a time of change for banks and other financial institutions. The changes will not be revolutionary, but a logical progression that reflects a less restrictive regulatory environment, expanding demand for both access and function, global activities and relationships, technological capability and healthy competition for a market that is becoming steadily more sophisticated in its demands and expectations.



The information services and products supporting this market are both facilitators and beneficiaries of many of the changes occurring, as systems integrators smooth resource consolidations resulting from mergers and acquisitions, and outsourcers provide a means of freeing capital, fixing or reducing costs and improving profitability. Telecommunications is the "lubricant" that allows all the disparate parts of this industry to work together and communicate with each other, and the Internet is the wave of future low-cost, global access to almost all financial and banking services.

B

User Recommendations

Recommendations for users resulting from the issues and analyses contained in prior chapters of this report are presented in Exhibit VII-1.

Exhibit VII-1

User Recommendations

- Investigate and determine what information systems improvements can be accomplished most rapidly and economically using information services vendors and products.
- Determine opportunities for outsourcing and consider the impacts of this approach on profitability and capital position.
- Consider downsizing and/or merging data centers both to save costs and improve institution competitiveness.
- Investigate opportunities to implement electronic banking.
- Develop a plan that realistically assesses the potential of the Internet and considers the attributes of this new and growing resource. Decide where the Internet fits in your plans for both providing information and delivering financial services. Create an implementation plan.
- If you haven't already done so, consider imaging and its possible use in your organization. Workflow analysis will be a useful tool for evaluating the need for benefits of imaging.
- Evaluate the cost effectiveness and features of available software packages versus in-house development of new applications or capabilities.
- Don't forget the Year 2000 issue. Will the date fields in your software work with entries beyond 1999? If not, consider using one of the excellent analysis and conversion services provided by information services vendors to perform necessary work, thus freeing your in-house staff to concentrate on mission-critical activities.

Source: INPUT



C

Information Services Vendor Recommendations

Recommendations for information services vendors generally parallel those for users, as they derive from the same set of issues. These recommendations are presented in Exhibit VII-2.

Exhibit VII-2

Vendor Recommendations

- Focus on the strategic position of your client.
- Consider likely merger opportunities and the impacts on clients.
- Identify and promote the benefits of investing to achieve competitive advantages.
- Place more emphasis on selling to financially and competitively strong nonbank financial services firms.
- Promote the development of electronic banking.
- If you don't already have them, develop the skills to make effective use of the Internet, and apply those resources to the needs of your clients. Help them to achieve competitive advantage using the Internet.
- Be prepared to offer well-documented cost justifications of new applications approaches and software offerings.
- Imaging vendors should aid users in analyzing workflow to determine applicability and benefits of imaging solutions.
- Vendors should consider the applicability of a Year 2000 conversion service to their existing product/service line. Key issues will be the level of effort necessary to provide such a service versus the time remaining to apply it, the compatibility of such an offering with existing product/service lines, and the acceptance of such a service by the vendor's established client base.

Source: INPUT



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Forecast Database

This appendix contains the forecast database for the period 1995-2000 and the 1995 Market Analysis Program database reconciliation.

A

Forecast Database

Exhibit A-1 presents the detailed 1994 actual and 1995-2000 forecast for the banking and finance sector.



Exhibit A-1

**Banking and Finance
Market Size by Product/Service Category, 1994-2000**

PRODUCT/SERVICE CATEGORIES	Growth		1995 (\$M)	1996 (\$M)	1997 (\$M)	1998 (\$M)	1999 (\$M)	2000 (\$M)	CAGR 95-00 (%)
	1994 (\$M)	94-95 (%)							
INDUSTRY TOTAL	16,711	12%	18,763	20,969	23,467	26,256	29,447	33,030	12%
Professional Services	2,925	11%	3,257	3,554	3,862	4,185	4,542	4,926	9%
- IS Consulting	810	11%	899	982	1,087	1,197	1,317	1,442	10%
- Education & Training	435	9%	476	521	570	624	682	748	9%
- Software Development	1,680	12%	1,882	2,051	2,205	2,364	2,543	2,736	8%
Systems Integration	719	19%	859	1,028	1,242	1,500	1,817	2,147	20%
- Equipment	230	15%	265	302	344	388	439	492	13%
- Software Products	51	20%	61	76	99	123	152	184	25%
- Professional Services	400	22%	487	594	730	904	1,121	1,345	23%
- Other	38	21%	46	56	69	85	105	126	22%
Outsourcing	3,684	18%	4,341	5,131	6,070	7,203	8,538	10,158	19%
- Platform Operations	825	13%	935	1,029	1,121	1,211	1,291	1,376	8%
- Applications Operations	1,700	17%	1,982	2,310	2,693	3,139	3,659	4,265	17%
- Desktop Services	428	22%	522	647	803	996	1,234	1,531	24%
- Network Management	399	22%	487	618	785	1,009	1,274	1,609	27%
- Application Managem't	170	20%	204	249	301	364	441	533	21%
- Business Operations	162	30%	211	278	367	484	639	844	32%
Processing Services	4,490	9%	4,880	5,280	5,700	6,122	6,580	7,006	8%
- Transaction Processing	4,490	9%	4,880	5,280	5,700	6,122	6,580	7,006	8%
Network Services	1,038	14%	1,182	1,358	1,572	1,835	2,157	2,536	16%
- Electronic Information Svcs	918	14%	1,047	1,203	1,392	1,630	1,912	2,245	16%
- Network Applications	120	13%	135	155	180	205	245	291	17%
Applications Software	2,615	10%	2,871	3,126	3,406	3,671	3,950	4,255	8%
- Mainframe	1,125	9%	1,221	1,318	1,411	1,490	1,575	1,670	6%
- Minicomputer	825	10%	905	980	1,072	1,150	1,225	1,300	8%
- Workstation/PC	665	12%	745	828	923	1,031	1,150	1,285	12%
Turnkey Systems	1,240	11%	1,373	1,492	1,615	1,740	1,863	2,002	8%
- Equipment	505	7%	540	575	607	640	673	705	5%
- Software Products	490	13%	553	602	658	715	775	835	9%
- Professional Services	245	14%	280	315	350	385	415	462	11%

Source: INPUT



B

Forecast Reconciliation

Exhibit A-2 offers a reconciliation of the 1994 and 1995 forecast for the banking and finance sector.

Exhibit A-2

Banking and Finance
1995 MAP Database Reconciliation

Product/Service Categories	1994 Market				1995 Market				84-89	94-99
	1994 Market Forecast (\$M)	1995 Report (Actual) (\$M)	Variance From 1994 Forecast		1994 Market Forecast (\$M)	1995 Report Forecast (\$M)	Variance From 1994 Forecast		CAGR per data 94 Rpt (%)	CAGR per data 95 Rpt (%)
			(\$M)	(%)			(\$M)	(%)		
Total	16,314	16,711	397	2%	28,623	29,447	824	3%	12%	12%
Professional Services	2,885	2,925	40	1%	4,333	4,542	209	5%	8%	9%
Systems Integration	689	719	30	4%	1,786	1,817	31	2%	21%	20%
Outsourcing	3,381	3,684	303	9%	7,400	8,538	1,138	15%	17%	18%
Processing Services	4,502	4,490	-12	0%	7,210	6,580	-630	-9%	10%	8%
Network Services	1,011	1,038	27	3%	2,109	2,157	48	2%	16%	16%
Applications Software	2,612	2,615	3	0%	3,940	3,950	10	0%	9%	9%
Turnkey Systems	1,234	1,240	6	0%	1,845	1,863	18	1%	8%	8%

Source: INPUT

In this steadily growing market, except for outsourcing (which increased by 9% based on contract award tracking), there were only minor variations between the 1994 projection for 1994 expenditures and the actual amounts recorded in the 1995 report. Other variances ranged from a 1% underestimation of the 1994 professional services market to a 4% underestimation of the growth of the systems integration market.

Variances in the projections for 1999 ran from -9% (processing services) to 15% (outsourcing), as processing services agreements were converted to longer term, more cost-controlled outsourcing contracts. All other 1999 forecast estimates varied only 1% to 5%, with the 1999 figures higher as the result of the more favorable growth projections noted in this report.



The five-year compound annual growth rates (CAGRs) showed a variance of no more than 1%, except for the 2% decrease in processing services growth resulting from the shift of more of this activity to outsourcing services.



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