U.S. INFORMATION SERVICES
MARKET ANALYSIS PROGRAM

Insurance

Information Services Opportunities & Trends

1992-1997

INPUT®

1280 Villa Street, Mountain View, CA 94041, (415) 961-3300

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Industry Sector Markets, 1992-1997
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I

Introduction

A

Purpose and Methodology

1. Purpose

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

1. Industry Introduction - Introduce the reader to the insurance industry's structure and demographics.

2. Business Issues and Trends - Identify the business issues and trends that are driving the use of information services within the insurance industry.

3. Systems Uses and Issues - Discuss how the insurance industry uses information systems and the issues facing insurance industry information systems organizations.

4. Information Services Market - Discuss the information services market within the insurance industry, including market sizing and the factors driving market demand for each delivery mode.

5. Competitive Environment and Vendors - Discuss the competitive environment and profile leading information services vendors in the insurance industry.

2. Methodology

A significant portion of the data on which this report is based was gathered during 1991 and 1992 as part of INPUT's ongoing market analysis program. Trends, market size and growth rates are based primarily upon interviews with users within the insurance industry and the

IS vendors that serve them. INPUT maintains ongoing relationships with, and a data base of, all users and vendors that it interviews. Interviewees for the research portion of this report were selected from this data base of contacts.

In addition, extensive use was made of INPUT's corporate library located in Mountain View, California. The resources in this library include on-line periodical data bases, subscriptions to over 50 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.

It must be noted that vendors 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 delivery modes from those used by INPUT. Thus, INPUT must estimate revenues by these categories on a best effort basis. The delivery mode and individual segment forecasts should be viewed as indicators of general patterns and trends rather than specific, detailed estimates for individual years.

When the information is provided from vendors as requested, at times it is provided under an agreement of confidentiality. Therefore, vendor rankings based on these revenue figures should be considered indicative rather than definitive, and the revenues themselves should be viewed as approximations only.

B
Industry Structure

For purposes of this report, the U.S. insurance industry is segmented as shown in Exhibit I-1.

EXHIBIT I-1

Major Insurance Sector Segments

Segment	SIC Codes
Property and Casualty (P&C) Companies	635 636
Life and Health (L&H) Companies	631 632
Independent Agents and Brokers	641

1. Descriptions

Property and Casualty Insurance - Property and casualty (P&C) insurance includes two distinct subsegments. Commercial P&C insures businesses, governments, and other commercial and noncommercial organizations against financial loss from physical damage to their property and against financial loss from lawsuits or other casualties—generally relating to injuries to individuals or other organizations. Personal P&C insures individuals—especially homeowners and owners of automobiles—against property and casualty losses.

Life and Health Insurance - Life and health (L&H) insurance is actually two quite different businesses. Life insurance includes traditional death-payment insurance in both standard and innovative forms, as well as savings and investment-related financial instruments such as annuities. The various forms of life insurance are often sold directly to individuals, often to supplement minimal employer-provided benefits. Health insurance, in contrast, most often is provided in whole or in part by employers as a fringe benefit to employees, covering some or all of the costs of routine medical care as well as providing some form of coverage for unusual major or catastrophic medical care that most individuals could not pay for directly. For purposes of this report, state-by-state Blue Cross and/or Blue Shield organizations that provide only medical insurance on a nonprofit basis are included in the L&H segment. Although the "Blues" are affiliated with one another across state lines (and may even subcontract with one another for certain administrative or computer services), each state's organization operates independently as to assumption of financial risk for medical costs of those it insures.

Independent Agents or Brokers - Independent agents and brokerages (collectively referred to here as agents) serve as intermediaries between individuals or organizations seeking insurance and the insurance companies. Primarily, agents match the needs of the insureds to the loss-coverage or other financial programs offered by one or more insurers, selling the insurance decided upon and collecting a sales commission. Secondarily, agents may service the insured's account over time (especially in the case of commercial P&C accounts), although often the main working relationship after sale is between the insured and the insurance company itself, not through the agent or broker.

2. Premium Concentration

The P&C segment (SIC 635, 636) and the L&H segment (SIC 631, 632) each comprise many separate insurance "carriers"—the companies that carry the financial risk for those insured after underwriting to assess the likelihood of losses. As shown in Exhibit I-2, however, each segment is also highly concentrated, with the leading carriers responsible for a disproportionate percentage of yearly premium revenues.

EXHIBIT I-2

Insurance Company Concentration

Company Ranking	Percent of Premium	
	Life & Health	Property & Casualty
Top 20	53	55
21-100	44	31
Others	3	14
Total	100	100

Sources: *U.S. Statistical Abstract*, 1991
Fortune, 1991

3. Employment

Total employment in the insurance industry is just under 2 million. As shown in Exhibit I-3, employment in the P&C segment totals over 500,000, and in L&H over 700,000. Agents (including other insurance services) employ about 700,000.

EXHIBIT I-3

Insurance Segment Employment

Segment	Approximate Number of Employees
Property and Casualty (P&C) Companies	500,000
Life and Health (L&H) Companies	700,000
Independent Agents and Brokers	700,000

Source: *U.S. Statistical Abstract,* 1991

C
Organization and Contents of Report

The remainder of this report is organized as follows:

Chapter II , Trends, Events and Issues, provides background information on the business issues and trends that are driving the use of information services within the insurance industry.

The section on trends and events focuses on two areas:

- The impacts of general business trends, such as globalization of markets, increased pace of change, organizational fragmentation, and the continuing use of technology to change basic operational practices
- Insurance industry-specific trends and events, including consistent patterns of financial cyclicality, industrywide handling of major losses, and anticipated competitive and regulatory changes

The section on issues identifies specific questions that should be asked and situations that should be addressed in developing a business strategy to provide information services to one or more segments of the insurance industry.

Chapter III, Information Systems Environment, provides an overview of the basic business processes in the insurance industry and their supporting information systems applications. Networks and data communications are considered in this analysis.

The impact of new and emerging technologies on applications and IS organizations is addressed, as are organizational and budgetary considerations.

Chapter IV, Information Services Market, looks at the insurance industry from two viewpoints:

- By delivery mode: How are these services delivered? INPUT's seven defined delivery modes are:

  - Processing services
  - Turnkey systems
  - Applications software products
  - Systems operations
  - Systems integration
  - Professional services
  - Network services

- By industry segment: Who is buying information services? In other words, what segments within the insurance industry are buying services in which delivery modes?

Overall market forecasts are provided by delivery mode and industry segment.

Chapter V, Competitive Environment, identifies significant IS vendors in the industry, discusses some of the factors that affect the competitive dynamics of the industry, and profiles representative vendors.

Chapter VI, Conclusions and Recommendations, reviews the trends and opportunities described in the report and provides recommendations for vendors as well as users.

In addition, there are two appendixes:

Appendix A presents industry-specific definitions used throughout the report.

Appendix B presents the *Forecast Data Base and the Forecast Reconciliation*. The forecast data base contains a yearly (1992-1997) forecast of user expenditures by delivery mode for the insurance industry as a whole and for each industry segment. The forecast reconciliation compares this report's forecast with the forecast provided in INPUT's previous insurance industry report and notes the reasons for any major differences.

II

Trends, Events and Issues

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

Section A, Trends and Events, highlights the business and social forces—as well as key technology trends—driving the insurance industry and shows how the industry is responding to these forces.

Section B, Issues, identifies specific questions that should be asked and situations that should be addressed by IS vendors in developing a business strategy that is responsive to the industry trends discussed in Section A.

A
Trends and Events

1. General Business Trends

1991 was the year in which the economic slowdown was expected to end, the recovery to start, and the ambiguities of an uncertain economy to gradually disappear. The end of the Middle East crisis brought a brief euphoria as troops, victorious in Iraq, returned home to hopes that the end of the conflict would "jump-start" the economy. Some encouraging signs were seen, but by year-end 1991, the U.S. economy was still sluggish, with no clear signs of a near-term sustainable recovery. Phrases such as "all the necessary pieces to initiate and sustain a recovery are in place" have been common in the media, but as late as March 1992, the hoped-for upturn in the economy is yet to be seen. Few disagree that a return to economic growth will happen, but opinions vary widely as to when the turnaround will occur, how quickly the economy will rebound, and what the new growth rates will be for the country, the various industries, and the financial resources that fuel the economy. Most analysts do agree on one thing, however: American workers' faith in the economy—as demonstrated by their willingness to spend and invest, and their motivation to compete in the world and domestic markets as demonstrated by the quality of their work product—will have a major role in igniting and fueling the recovery when it does occur.

In mid-March, 1992, a number of encouraging signs appeared—purchases of consumer goods have increased, and sales of homes, stagnant for better than a year, are showing an upturn. Many are taking this to be a sure sign that the government's programs to increase consumer spending, thereby fueling a sustainable recovery, are starting to show positive results. INPUT feels that it is still too early to tell, but a recovery should start to become clearly visible at all levels by the end of 1992.

Recovered or not, however, the U.S. economy is still active and *the* major factor in world commerce. As such, a number of national and international business trends continue to impact the insurance industry.

1990-1992 Recession in the U.S. - Official or unofficial, recession in the U.S. finally ended a decade of largely uninterrupted economic growth. As noted below, junk bond debt was one of the first 1990-1991 casualties of the slowdown, causing havoc at some insurance companies. Commercial real estate took a sharp downturn in value as a result of overbuilding, and as available space exceeded demand, rental revenues fell. The slowdown also raised the rate of business bankruptcies and imperiled the portfolios of loans outstanding for financial institutions.

Global Competition - The increasingly global level of competition facing many U.S. industries is a key business trend for the insurance industry as well, but one more of opportunity than threat. Many insurance companies are paying more attention to global strategies, viewing the international market as discretionary—one in which opportunities can be addressed if the benefits outweigh the risks. Insurers are watching their large clients deal more and more in international markets—especially the Far East and the newly unified European community—and the insurance company that can satisfy most of a client's needs in the global market of the 1990s (and beyond) will have a significant competitive edge. The global market is also significant from an actuarial standpoint since it further broadens the risk base.

Junk Bond Debt - The 1980s' excesses in the issuance of junk bond debt to finance corporate takeovers and leveraged buyouts became accountable in the early 1990s, especially as the economic slowdown cut the ability to service the debt undertaken. The result was insolvency in some cases and substantial restructuring of the debt in others. Either case impacted insurance companies with substantial junk bond holdings. In some instances, the debt was swapped for equity, increasing the debt holders' asset base but cutting their anticipated high rates of (junk bond) interest return. Although junk bond holdings have decreased in value with the disruption and decline of that market, for most insurers these instruments have been a relatively minor portion of their holdings. However, for those companies with excessive investments in junk bonds, such as Equitable Life or the insurance units of First Capital Holdings Corp. and First Executive Corp.,

the results were catastrophic. Financial analysts also note that many junk bonds have depreciated to the point that they now have a reasonable intrinsic value, and as such, are legitimate inclusions in an investment portfolio.

Downturn in Commercial Real Estate - Starting in 1989, well before a generalized recession was widely acknowledged, U.S. financial institutions—especially savings and loans—saw a clear and negative regional pattern—a rolling recession in real estate values, starting in the Southwest oil patch and the Northeast industrial sectors, and moving into the Southeast, the Mid-Atlantic states, and even the golden California real estate market. As the downturn in values reached the commercial real estate market, the commercial mortgage portfolios of the insurance industry were affected and delinquencies in 1991 grew to a record high of 5.6%. Industry pessimists believe that delinquencies could go as high as 7% in 1992, but as home sales turn up in early 1992, it is reasonable to expect that an improving economy will also benefit the commercial real estate market and the delinquency rate will fall to more tolerable levels.

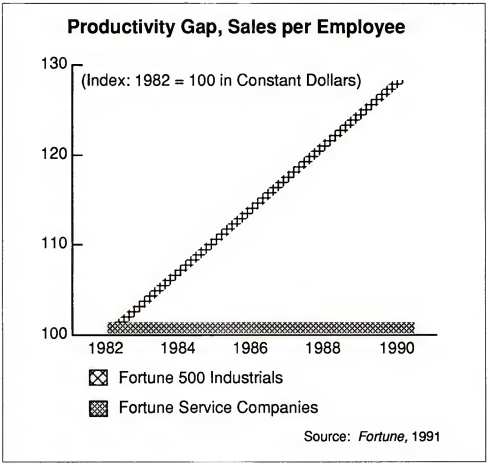
Ratings Downgrades - Many insurance companies have experienced ratings downgrades from such firms as A. M. Best. In some cases, the ratings reflect deteriorated performance, but in many others, the new ratings are simply the result of an expanded and more accurate rating system. Best's insurance company rating categories, for instance, have grown from nine to fifteen, reflecting both recent excesses in investment conduct and a desire to more accurately portray an insurance company's financial performance. The insurance industry is in good company, as a number of businesses in various industry sectors have seen their ratings deteriorate as a result of both the slowed economy and liberal investment practices. Not surprisingly, however, few companies that received a rating lower than that held before are satisfied that the needs of accuracy have been served.

Productivity Problems - A final general trend is that of the reaction to the perceived productivity gap between U.S. workers and their foreign counterparts. *Fortune*, in its analysis of the 500 largest U.S. service companies (June 3, 1991), diagrammed the productivity gap between U.S. industrial and U.S. service companies, as shown in Exhibit II-1.

The disturbing thrust of the analysis is that blaming the recession for the declining financial performance of the American service industry is misleading. Although the recession clearly has been a significant factor in financial performance, while services rode the crest of the economic boom of the 1980s, manufacturers—increasingly challenged by foreign competitors—reduced work forces and improved quality and productivity. As a result, average sales per employee (adjusted for inflation), rose by 27% between 1982 and 1990 for U.S. industrials, while, for the same period,

U.S. services productivity fell 1%. Although insurance companies have always been strong and innovative users of information technology, they, like other services organizations, still must improve if they are to continue to be effective competitors in the "lean and mean" 1990s.

EXHIBIT II-1



2. Insurance Industry Trends and Events

In the words of one industry analyst, 1991 was the year that the insurance industry would like to forget. Although this is a slight overstatement, the fact remains that 1991 was a difficult year for the industry. Consider the following:

1991 Retrospective - Exhibits II-2 and II-3 offer a simplified view of the major events influencing the U.S. life insurance industry (Exhibit II-2) and the worker's compensation segment of the property and casualty industry (Exhibit II-3).

EXHIBIT II-2

U.S. Life Insurance Industry
1991 Retrospective

- Junk Bonds - About 7% investment of general account assets in lower grades
- Commercial Real Estate - Downturn in values, with major short-term impact
- Ratings Downgrades - More stringent standards drive lower ratings

Source: *Underwriter's Report,* 1992

EXHIBIT II-3

U.S. Property and Casualty Insurance Industry
Worker's Compensation, 1991 Retrospective

- Overburdened by volume and magnitude of claims. California is a worst case example:
  - Worker's comp benefit is twice the unemployment benefit, encouraging abuse
  - Litigation
    - 20% increase since 1988
    - Averages $7,000 per case
    - Costs 59-67 cents of every benefit dollar
- Fraud a constant problem
- Rate increases—slow and low

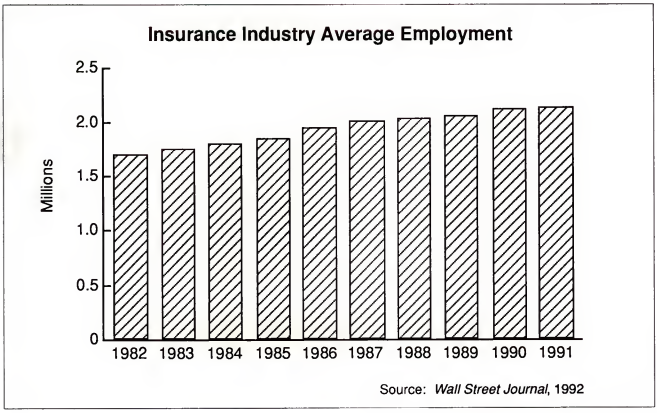
Source: *Underwriter's Report,* 1992

In general, the pressures on the life insurance industry reflected the pressures on the insurance industry as a whole. The influence of the recession was pervasive, and the 7% proportion of general account assets in lower grade junk bonds, coupled with the general decline in commercial real estate, were influential in many ratings downgrades.

Worker's compensation claims, perhaps influenced by economic motivation, have grown in both volume and magnitude. In California, for instance, worker's compensation benefits are twice those of unemployment, giving rise to concerns of benefit abuse. Litigation is up 20% since 1988, averaging $7,000 per case and costing 59 to 67 cents from every benefit dollar. Fraud remains a pervasive problem and rate increases, which could reflect industry responses to these conditions, have been slow to be approved and, most often, do not represent the real costs of the insurance.

Insurance Industry Employment - As noted in the discussion on worker productivity, employment in the insurance industry rose to record highs in 1991, peaking in June at 2,139,000. Most insurance companies are concerned about this trend, and many are planning cutbacks over the next few years. This plan, however, will be heavily influenced by the actions of the ten largest employers, who have approximately 14% of the total employee population. The 1982-1991 employment growth in the insurance industry is diagrammed in Exhibit II-4.

EXHIBIT II-4



a. Financial Performance

The financial performance of the insurance industry reflected both the underlying stability of the industry and the near-term influence of a recessionary economy.

Financial Stability - Strangely enough, although the insurance industry felt that 1991 was a difficult year, investors valued their stocks at levels and gains unseen since 1985. The logic behind this appears to be that 1990 was such a bad year that the financial community had already discounted insurance industry securities, and that the 1991 gains recorded were high as a result of the base being so low. As noted in Exhibit II-5, the life and health and property and casualty stocks of a grouping of major companies outperformed most other insurance groupings and the market as a whole. On the other hand, companies serving the insurance industry also did well, as did financial services companies.

Sales Growth and Profitability - Exhibit II-6 notes the latest 12-month performance for diversified, life and health, and property and casualty companies, and compares 12-month sales growth results against 5-year averages. With the exception of life and health, sales growth for the latest 12-month period is below the five-year averages—and life and health results approximate those averages. Property and casualty performance is especially depressed, reflecting the economy-influenced conservative attitudes of insurance buyers who were willing to assume a greater risk to conserve current funds. Ironically, improvements in the economy will not necessarily mean better days for property and casualty companies since an easing of economic pressures means more travel, which results in more accidents, producing more claims. Profitability differences between insurance company types is minor, with the median values for the three industry groupings varying by less than 1%.

EXHIBIT II-5

Insurance Stock Results for 1991

Measurements of...	Percent Change from 1990
...General Market	
• Dow-Jones Industries	20.32
• S&P 500	26.31
• NASDAQ Composite	56.84
• NASDAQ Insurance	33.25
...Insurance Industry	
• 11 Multiline Companies	34.02
• 44 Life & Health Companies	61.62
• 43 P&C Companies	50.79
• 6 Large Brokers	13.93
• 9 Reinsurers	26.52
• 11 Specialists	28.93
...Other Stocks	
• 8 Services Companies (servicing the insurance industry)	57.11
• 9 Financial Services Companies	65.73

Source: *National Underwriter*, 1992

EXHIBIT II-6

Insurance Company Performance
Sales and Profits
(Median Values for Major Companies)

Type of Insurance Company	Sales Growth		Profit Margin
	5-Year Average (%)	Latest 12 Months (%)	Latest 12 Months (%)
Diversified	7.8	5.9	4.7
Life & Health	9.0	9.3	5.3
Property & Casualty	10.8	3.9	4.9

Source: *Forbes*, 1992

b. Other Trends and Events

A number of other trends, events and issues are influencing the insurance industry as it moves toward the mid-1990s. The most important of these are discussed below.

Regulation - Historically, the insurance industry has been subject only to state regulation. Many feel that monitoring and control at this level is inadequate, and that federal regulation would better serve the interests of the industry, its clients and its investors. Exhibit II-7 summarizes the arguments in favor of federal regulation. In general, they reflect a response to the state-monitoring inadequacies that have led to a number of highly publicized failures and the perception of a need for more stringent and consistent solvency controls. Whether federal regulation, in some form, will become a reality remains to be seen. 1992 is a presidential election year, and attention will be focused on popular vote-getting issues. It is unlikely that the pressures for federal regulation will be strong enough to force viable legislation. In the absence of any major company failure, there will probably not be any significant action before 1993.

Health Care Costs - As medical care in the U.S. has become increasingly "high tech," health care costs have risen at a steady 10% or more per year from 1980 to 1988. The one-year increase in medical expenditures from 1990 to 1991 was almost 12%. Total health care spending, at two-thirds of a trillion dollars, today represents about 12% of the U.S. gross national

EXHIBIT II-7

The Insurance Industry
Arguments in Favor of Federal Regulation

Federal Regulation...

- Would correct state regulatory inadequacies
  - Inadequate staffing
  - Infrequent examinations
  - Ineffective licensing procedures
  - Don't require use of independent audit and actuaries
  - Inconsistency in guaranty fund administration
- Would improve solvency controls
  - Consistent for all states
  - Better loss data to govern rates
- Would require antitrust exemption to pool experience data

Source: *The Broker*, 1991

product. According to the U.S. government's Health Care Financing Administration, this could rise to a full trillion dollars, or over 13% of GNP as soon as 1995, and $1.5 trillion (15% of GNP) by the year 2000. Today, a multiday hospital stay is a major financial burden to an uninsured middle-class citizen, and extended or catastrophic care can cause extreme financial sacrifices. Drug- and violence-related medical costs run highest in poorer urban centers where hospital facilities are most overloaded, insurance coverage is spotty, and financial resources are most limited.

Although government Medicare and Medicaid coverage has successfully used diagnosis-related, group-based fixed-payment systems to control somewhat the cost of public funding of medical care, many costs have simply been shifted to those paying for care through private insurers, who have been largely unsuccessful in containing medical costs. Cost control through health-maintenance organizations (HMOs) and preferred-provider organizations (PPOs) has so far been relatively unsuccessful, but there are some encouraging signs that the PPOs may have some positive impacts in the mid term.

The public sector (mostly through the federal Medicare system for the elderly, with 33 million persons enrolled, and the state Medicaid programs for the poor) funds 41% of health care costs, with the private sector covering 59%. Thus, businesses that fund employees' health insurance are absorbing the bulk of the increases in medical expenditures. Employer-sponsored medical plan costs were up 20% in 1989, and businesses now spend an estimated $140 billion per year on health care.

Surprisingly, some observers believe that as much as 30% of all medical care in the U.S. is unneeded. This explains the observation that the most effective action that employers can take to control medical costs for their employees—and thus their health insurance rates—is to require "precertification" (preapproval by the insurer's staff) for any non-emergency hospital treatment. In addition, there is a growing trend toward medical cost management, where the insurer works with the hospital to manage the employee's treatment, shortening the stay and minimizing tests and treatments as appropriate.

With the trend toward cost-shifting to those covered by private insurance—most of which is paid for by employers—the medical insurance cost burden of employers appears near the breaking point. Employers' health costs have risen at an alarming rate, and more and more companies are now moving towards participatory programs that require employee contributions.

Given this backdrop, the AIDS crisis appears to generate a prescription for disaster in health care funding. Given relatively little experience yet with AIDS, and an uncertain outlook for new treatment, estimates of total life insurance claims and medical costs for AIDS in the period from 1990 to 2000 range widely, from $50 billion to $125 billion. One difficult conflict that emerges from the uncertainty is that new AIDS treatments will likely ease suffering and extend lives, but only at the price of substantially increasing total health care costs for insurers and society. Even with state-permitted testing of new health insurance applicants, many previously insured or group-insured individuals will incur such costs. At $50 billion, some observers see this as a manageable financial burden for the insurance industry, at least through the year 2000. At $125 billion, there is much more uncertainty and an increased risk of financial collapse.

A national health insurance program of some sort appears a natural outcome of needs generated by the many uninsured, AIDS costs, and the aging of the baby-boom group. Some proponents note that among major industrialized nations only the U.S. and South Africa lack such a program.

Yet key inhibitors loom as well. A national program would probably eliminate most insurance company participation in health care funding, in favor of a single national (or multiple regional) insurer(s). The primary motivation would be to cut claims administration costs—especially by

minimizing or eliminating costs for eligibility verification. Some argue that such a program goes against the grain of "independence-minded" Americans, and note that most Americans who actually vote are covered by employer-funded health insurance carriers, and thus are largely insulated from direct contact with the problems of lack of coverage or cost increases.

Several federal proposals have been introduced for national health insurance, generally mandating minimum health care benefits for all citizens, with no exclusions and with a low limit on catastrophic care coverage to be paid by the individual. Some level of health care resource rationing might be included or might evolve over time. Phase-in over a ten-year period is generally specified. Observers seem to be in consensus that national health insurance in some form is possible, but unlikely before 1995, and more likely but not certain after 1995. Proposals could still be revised either to keep private insurers involved in administering the system or to deny them involvement, so impacts on the insurance industry (assuming eventual implementation of some such system, an additional uncertainty) remain unclear.

Competition - Until very recently, banks have remained largely restricted by the 1933 Glass-Steagall Act from diversifying beyond basic banking functions, even into related financial businesses such as mutual funds, insurance, and real estate. The sentiment that brought about the Glass-Steagall Act may now be changing. A recent state action in Delaware (since challenged by the Federal Reserve) opens the opportunity for banks or banking subsidiaries chartered in that state to sell and underwrite insurance within the state and perhaps nationwide. Florida and Illinois, however, have turned back similar efforts. Based on court interpretations, banks already have the power to undertake asset-based underwriting (backed, for example, by credit card receivables).

How important a factor in the insurance industry banks will become is an open question. Although the deregulatory climate in the U.S. has tended to liberalize participation in markets that were previously restricted to specific business or institutional groups, the state-by-state nature of the insurance industry (as it is now structured) will make any initial bank impact on insurers a localized concern. It is unclear whether, under any scenario, substantial underwriting by banks will occur in the near future, or if, instead, banks will be content to sell insurance underwritten by others, and simply collect the commissions.

3. Technology Trends

From the early days of computers, the insurance industry has been a leader in implementing new information technologies. From one point of view, the core business of insurance is to function as an "information factory," taking in data regarding broad patterns of demographic and loss experi-

ence, and specific information about those that are insured, then generating policies to cover risks and make payments for claims. With no physical inputs or products, an insurance company's success or failure over time depends in large part on continuing competitive advances in processing the information that forms the core of its business.

Historically, through the 1980s, insurers' use of computers and information systems emphasized cost-cutting—for example, the replacement of accounting or clerical personnel with batch processing systems. Observers agree that most of the available replacement-based advances have now been made by the vast majority of insurers.

For the 1990s, insurance information systems advances will focus increasingly on moving beyond cost cutting toward achieving strategic competitive advantage by designing and implementing higher-level, more integrated information systems that serve to improve the efficiency—and especially the effectiveness—of knowledge workers so that companies can avoid errors, better serve customers, "work smarter," and handle growing volumes of business with stable or slowly growing levels of staffing. Gone are the days when top and divisional management can extol an information system's labor-saving capabilities, turn the project over to systems developers, and get back a "packaged" system that leads to clerical layoffs or other cost cutting. Users must now set the objectives and buy into the project, and technologists must focus on business needs.

Insurers face a knotty problem in this transition. Their past leadership in information systems advances leaves them with vast installed bases of systems that can function in one of two ways. Some insurers find that older systems—especially if they have been improved and brought up to date over time—are the perfect springboards to new systems advances and levels of integration. Others are discovering that future innovation is inhibited—or at least rendered more expensive—by the need to scrap many older, outdated systems that cannot be cost effectively integrated with the systems required to compete in the 1990s. The classic example is that insurers with many batch-oriented systems still in operation—systems that were very innovative in their early days—often find that they first must transfer to an on-line transaction processing environment before they can begin the kind of systems and records integration that is becoming standard as a competitive tool for better customer service.

The following are the major areas of technological opportunity and activity for the mid-1990s:

Agent/Broker Systems - Looking at specific information systems technologies, the networking of insurers' and agents' systems remains a promise of great advances largely unfulfilled to date. With great fanfare over the last decade, for example, many insurers helped agents purchase and install

minicomputer- or PC-based agency automation systems. Insurers expected agents to use those systems to tie electronically into the insurers' networks to achieve, for example, rapid approval and issuance of new policies. The reality is that agents have used the systems to improve local record keeping, sales support and proposal preparation, but have implemented relatively little communication with insurance carriers. There are some notable exceptions to this, but in general, most interactions between insurance companies and agents are not at the automated, integrated level possible with installed technology. In part, the reason is that carriers have not abided by consistent networking standards through which an agent easily can use a single local system to network with multiple carriers, both to compare quotes and to efficiently serve clients insured by different carriers. Thus, agents generally have not evolved beyond paper-based communications with carriers, except perhaps to start using fax instead of mail to send and receive the paper.

Isolated Data Bases and Applications - One technical legacy of insurers' pioneering history with information systems is that isolated information systems often were developed to serve only specific needs, resulting today in islands of data bases with little ability to connect or be integrated. This inhibits the company's ability to become a highly responsive data-driven organization, where knowledge workers can quickly access the right information from anywhere in the insurer's records to solve problems or meet customers' information or service requests.

Mainframes and Networked PCs - As systems innovators, insurers also have some of the nation's largest installed bases of large mainframe computers—until recently the only cost-effective processing power sufficient to meet their needs. In the 1990s, however, these mainframes are becoming increasingly expensive to maintain. This decade will offer insurers an environment of continually improving price/performance capabilities to off-load functions from mainframes to networked PCs and workstations, challenging systems organizations to plan and implement a major transition in insurers' systems architectures.

Expert Systems - During the 1980s, one bright spot in insurance company systems innovation was the use of expert systems software technology. Expert systems provided pioneering applications in underwriting, claims analysis, and fraud detection. Some of these applications have not yet moved beyond pilot stages, but many of them serve today as key aids to staff in a variety of insurance production functions. Most observers agree that use of expert systems by insurers will become commonplace in the 1990s.

CASE Tools - The 1990s may also see a parallel to insurers' leading role in expert system innovation in the fast-advancing discipline of CASE (computer-aided software engineering) and other software redevelopment technologies. With a mix of old systems to be renovated and new genera-

tions of systems to be developed to serve knowledge workers, CASE offers insurers an ideal vehicle to cut system development and maintenance costs and speed use of new systems into field production for competitive advantage.

Imaging - Another new technology perfectly positioned for insurance industry leadership is image processing—the electronic storage and retrieval of images of paper-based documents, rather than the paper itself. Even with vast information systems, estimates are that 70% to 90% of an insurer's information today resides on paper, not in its information systems. Costs to store this paper are huge, and delays and inability to find files are common. Innovative insurers are already starting to electronically scan most incoming and internal paperwork for storage on CD ROM or optical discs (one of which can hold the equivalent of a large encyclopedia), making disc-based images accessible through systems networks to home office and field staffers who need instant access to the documents. Costs are still high and the volume of old documents to scan is massive, but innovators see leadership in image processing as both a cost-cutting measure over time and a major boost in the effectiveness of their service to customers.

EDI - A technical uncertainty that remains for the 1990s is insurers' expanded implementation of EDI (electronic data interchange) for insurance applications. EDI is used extensively in industries such as transportation and manufacturing to provide direct, regularly scheduled computer-to-computer exchange of data—such as status of goods in shipment, or electronic purchase orders or notification of order fulfillment. In insurance, a parallel opportunity exists in claims submission and payment—especially between hospitals and large clinics, and the insurers responsible for payment.

Although substantial unit-cost savings (and faster reimbursements) are already being reported by the minority of hospitals and clinics making heavy use of electronic claims submission systems and services, to date the private insurance carriers have only begun discussion of standards for EDI data and transmission that will be required for the general use needed to make EDI more cost effective. Rather, most of today's electronic claims flow through central claims-clearinghouse services that take the claim information in the format provided by the hospital's or clinic's information system, translate it to the computer format required by the target insurance carrier or government agency, and then transfer it to the carrier or agency. The most significant body of electronic claims submissions, so far, is made by large providers of Medicare/Medicaid-funded services whose systems meet government claims-information requirements for electronic submissions, under clearly defined federal health care payments standards.

There is still relatively little parallel usage among private insurers. Without agreement on insurance-carrier EDI standards, it is unclear to observers whether insurers will rise to the challenge of more general use of EDI in the 1990s.

B
Business Issues

Exhibits II-8 and II-9 offer a brief summation of the key business issues and systems opportunities for the insurance marketplace that were discussed in greater detail earlier in this chapter.

EXHIBIT II-8

Insurance Industry
Key Business Issues

- The continuing effects of a slow economy
- Global market opportunities
- Junk bonds—a surprising asset?
- Decline in commercial real estate values
- The effect of ratings downgrades on securities
- High levels of employment—for how long?
- Declining sales
- Federal regulation
- Rising health care costs
- Competition from banks and other financial institutions

EXHIBIT II-9

Insurance Industry Key Systems Opportunities

- Aging of the installed mainframe base
- Better use of agent/broker systems
- Isolated applications and data bases
- Integration of networked PCs
- Expanded use of expert systems
- Application of CASE technology to software development
- Imaging
- Expanding EDI activities

III

Information Systems Environment

This chapter outlines the primary insurance industry uses for information systems, details the key business and technical issues facing information systems management, and assesses the impacts of key new technologies. Finally, a review of organizational control of and budgeting for information systems frames a discussion of key objectives and plans for information systems departments within insurance companies.

A
Applications

Although some applications used by insurers are common to other industries, many of those listed (by category) in Exhibit III-1 are unique to insurance. A brief summary of major systems and applications follows:

Rating Systems - Rating systems use formulas from insurance actuaries, apply certain risk profile characteristics, and apply these to a specific risk to provide underwriters with a base rate—dollars of premium per 1,000 dollars of risk coverage. Actual rates quoted and charged to customers often vary from these base rates (especially in commercial P&C underwriting), depending on current company directives and market, loss, and competitive conditions.

Actuarial Support Systems - Actuarial support systems provide mathematical and statistical number-crunching support for the company actuaries, who set standard rates based on historical loss experiences and anticipated future trends.

Policy Processing and Administrative Systems - Policy processing (P&C) or administration (L&H) systems differ somewhat from one another, while sharing a key core function—they serve to capture and then continually process/administer insurance policies bought and renewed by customers. These primary record systems are often integrated with many of the other systems listed, depending on the insurer's success in integrating systems that generally evolved separately over periods of years.

EXHIBIT III-1

Key Insurance Information Systems

- *Risk evaluation*
  - Rating systems
  - Actuarial support systems
- *Administration*
  - Policy processing (P&C) or administration (L&H) systems
  - Claims, loss history, and payment administration systems
  - Employee benefit and pension administration systems
  - Reinsurance administration systems
- *Financial*
  - Accounting, financial reporting, customer records, commission, and billing systems
  - Asset/investment management systems
- *Sales*
  - Sales support systems (remote access and laptop)
- *Communications*
  - Telephone switching and voice processing/response systems
  - Remote data base access networking
  - Branch office data networking
- *Agency functions*
  - Agency interface systems
  - Agency automation systems
- *General purpose*
  - Standard systems for human resources, payroll, etc.
  - Electronic imaging systems
  - Professional support systems
  - Executive information systems

Claims, Loss and Payment Systems - Claims, loss history, and payment administration systems provide the data entry point for initial information about an insured's claim, help a claims adjuster evaluate the claim for challenge or settlement, aggregate claims yearly and over multiple years in a loss history record for the insured, and administer payments of claims immediately or when settled with the insured.

Benefit and Pension Systems - Employee benefit and pension administration systems track the complexities of life and health benefits due to a firm's group of insured employees and administer these and any pension systems for retirees.

Reinsurance Systems - Reinsurance administration systems help track reinsurance coverage contracts and assign large losses to reinsurers for payment as covered by relevant contracts.

Accounting Systems - Accounting, financial reporting, customer records, commission, and billing systems differ from other industries' accounting systems in their complexity, particularly as to financial transfers that reserve funds for future loss payments (especially in P&C), complex tax treatments (especially in L&H), and regulatory requirements for periodic reporting of ongoing finances and capital ratios to state authorities. The other functions are more generic and less specific to insurance.

Asset/Investment Management Systems - Asset/investment management systems are used by insurers to capitalize on the relatively short (for health or automobile) or long (for traditional life coverages and for commercial P&C, especially liability) average period of time between receipt of premium income and payment of any resulting claims. These systems help them balance allocation of financial assets to achieve company goals while meeting regulatory requirements and maximizing investment values.

Sales Support Systems - Sales support systems (remote access, desktop, and laptop) have been used for years on a remote-access basis, assisting life insurance sales reps to illustrate multiyear premium, value, and payback financial scenarios to prospective buyers. Older remote systems still connect a terminal from the sales representative's office to a central mainframe, but desktop systems have brought this down to PC level; the latest laptop systems permit on-site illustrations that are becoming more and more valuable in the rapid closing of life insurance sales.

Telephone Systems - Telephone switching and voice processing/response systems are the information systems departments' generally successful moves to take over management of basic telephone services, which they have augmented in recent years with both simple voice mail systems and now with phone-pad-activated voice response systems to permit agents

and/or prospects/customers to secure specific rate quotation, policy, or other information over the phone. Some life insurance companies foresee permitting investment-instrument switching by customers over such telephone systems, given suitable error safeguards.

Remote Data Base Access - Remote data base access networking is most often used by underwriters to call into central service bureaus like Equifax or Policy Management Systems Corporation (for auto-related information on policy applicants) or the Medical Information Bureau (for L&H applicants). Dial-up, leased-line, or value-added network (VAN) options are all available.

Branch Office Networking - Branch office data networking from the insurers' home offices to the regional offices, where many functions are decentralized, has become nearly universal. Networking patterns range widely, from simple SNA connection of 3270 terminals to IBM hosts, up to sophisticated multilevel, multivendor distributed processing systems using intelligent workstations/PCs.

Agency Interface Systems - Agency interface systems at present are more a promise than a reality. Agents who work heavily with one or two insurers are more likely to use dial-up, leased-line, or VAN access for policy submission, approval, and/or account inquiry and update—versus agents who work with many carriers, whose use to date of the multicarrier interface systems on the market is far below the optimistic predictions of a decade ago.

Agency Automation Systems - Agency automation systems, in contrast, have tended to be the predominant end result of carriers' attempts to tie agencies more closely by supplying them with (or helping them to pay for) agency-based computers. Implementations range from simple to complex, but rarely are larger than midrange system size, except perhaps in large brokerages. Although there is a tendency to think of agency automation systems as being insurer-driven, in fact more and more agencies are establishing their own automation systems to better conduct and manage their business. Exhibit III-2 offers a profile of an insurance agency that has fully embraced automation of agency functions. As cost-containment and profit pressures continue, more agencies will seek the very tangible benefits of agency automation.

EXHIBIT III-2

Insurance Agency
Example of Full Automation

- *Agency profile*
  - 5 years old
  - $24 million annual premium volume
  - 17 U.S. offices (in 17 states)
  - 304 "producers" (agents)
- *Agency IS environment*
  - IBM mini (platform)
  - Wide-area network
  - Agency management software package
  - 60-70 application programs
  - Automatic daily backup
  - 40-50 workstations
- *Operating benefits of IS*
  - 50% fewer staff for premium volume
  - Below average operating costs
  - Clearly defined growth path

Source: *Agent & Broker*, 1991

Standard Systems - Standard systems for human resources, payroll, etc., are relatively generic systems used for typical payroll, personnel records, and related functions.

Electronic Imaging Systems - Electronic imaging systems take one of two forms, or may integrate the two. Older imaging systems are essentially computer indexes of microfilmed documents that speed image retrieval and viewing (and often printing) by a specialized microfilm equipment operator, with or without automatic "carousel" access to large numbers of microfilm cartridges. Newer imaging systems are generally WORM (write-once, read-many) optical disk systems that digitize images from

paper documents for storage on high-density optical storage disks, permitting image retrieval for viewing and/or printing by many persons equipped with computerized display equipment, often at remote worksites and ideally on their primary workstations.

Professional Support Systems - Professional support systems have emerged recently, most often in the form of expert systems to assist professional-level underwriters, claims adjusters, and others to tap embedded expertise to better judge risks, spot problems in claims, and handle other judgemental functions.

Executive Information Systems - Executive information systems are still relatively rare among insurers, reflecting the commonly nonintegrated state of company data bases. Where found, they permit top management (often with touch-screen or mouse-based technology) to "point and see" key operating and/or financial information.

B
IS Issues

1. Business Issues

A wide range of business issues faces information systems managers at insurance companies. Some of the most common issues are noted below:

Evolving Life Insurance Products - There appears to be no slackening of the pace at which L&H systems departments have to cope with changes in the terms of life insurance products, thus requiring system-based administrative support—especially for the increasingly popular annuity and investment-oriented offerings.

Customer Service - There is a continuous need for customer service improvements in information systems to help meet competitive pressures, both within the industry (especially for commercial P&C) and from outside (as in the case of competition to life product sales from alternate consumer investments in non-insurance instruments such as tax-deferred individual retirement accounts). Where product differentiation is small, service becomes a key attribute.

Budget Restraints - Although there are predictable cyclical low points in profitability that insurers seem to accept as part of the insurance business, 1990 and 1991 economic, competitive and profit pressures have brought IS budgets under much closer scrutiny.

Foreign Sales - Although substantial foreign sales by U.S. insurers are possible, one obstacle that will have to be overcome first is the likely requirement to adapt products to local practices and laws, not to mention non-English language environments. Systems impacts may be substantial.

Rate Setting - Whatever the outcome of current regulatory and legislative debates, the major insurance rating service organization—the Insurance Services Office (ISO)—has already announced that it will provide only loss history statistics in the near future, eschewing its traditional and complementary role of publishing advisory rates that historically have been adopted more or less directly by most insurers. Other rate-setting changes will likely emerge from political compromises in the shifting regulatory environment, but specific directions are not yet clear, nor are the exact impacts on information systems. One concern is that any effective implementation of a national, federally regulated insurance environment could require antitrust exemption to pool experience data.

Tax Reform - So-called tax reform in the late 1980s hit insurance companies with complex and sometimes costly new accounting requirements, to which many of the industry's information systems are still adapting. Other changes and impacts in the future are likely, although not in 1992, a presidential election year, when no one in an elected office wants to upset the voters.

National Health Insurance - Finally, the decade of the 1990s likely will see resolution one way or another of the question of national health insurance. One implementation scenario would retain significant administrative and information processing roles for today's insurers, another would shift most or all to one or more government bodies; intermediate scenarios could have mixed results. This uncertainty may cast a shadow over health systems innovation in the interim.

2. Technology Issues

In parallel, a number of key technology issues face insurance systems managers, as noted below.

Batch versus Dedicated Systems - Many insurers have evolved some or most of their systems from mainframe-based batch environments to various configurations that incorporate integrated and/or distributed on-line systems, often based on networked PCs. Many other batch systems remain in productive use, however, and will be replaced more or less quickly depending on management attitudes and other non-technical factors.

Unattended Production - Increasingly, newer data facilities are running on an essentially unattended basis. A higher proportion will do so in the future, responding to a convenient marriage of technological capability and reliability, and a need to reduce employee overhead wherever possible.

Productivity Improvements - With clerical-level cost savings largely wrung out of insurance organizations by past systems implementations, companies are shifting emphasis to qualitative rather than quantitative productivity improvements—for instance, new generations of professional-level support systems to help these employees "work smarter" and thus boost the firm's competitive performance. Long term, the hope is that these technologically enhanced workers will prove able to absorb increased workloads from larger business volumes with less-than-corresponding increases in their number and salaries. The result, over time, should include the more traditional types of productivity improvements. This change in the type of systems being implemented, however, will require top management to shift from its traditional demand for hard-savings productivity improvement measures as system justifications to as-yet-undefined new cost benefit analyses. Little formal ground has been broken on this front yet, but as the concept of re-engineering production and applications resources to do things not before possible becomes more pervasive, benefits and related justifications will certainly follow.

Networking - In networking, insurers often have led the way in corporate networking to the mainframe and, more recently, in PC-oriented LANs. A technical challenge for the 1990s, however, will be to integrate these two branches of network evolution into integrated companywide networks providing access, as required, to all data, systems, and resources.

On-Line Agencies - At present, agencies express relatively little enthusiasm for tighter networking with insurers, and few incentives are currently obvious that would change the market dynamics at work. Agreement on standards is lacking in an environment where insurers seem to presume that more open networking with agents would lead to more intense competition to win the business of the most desirable agents.

Data Bases - Insurers' historical isolated data bases could be integrated technically—given disciplined approaches to management of data as a strategic resource under RDBMSs—but the strategic payoff appears soft to many, and the dollar costs of such an evolution are clearly high. Therefore, while IBM's DB2 is occasionally used at certain insurance companies (and is the required data base for new development for a few), the general pace of RDBMS implementation in the industry is not great. Clearly, however, use of RDBMS technology is well under way among some leading-edge insurers, and as they obtain more effective use of their data bases, they should realize competitive advantages.

C
Impact of New Technologies

Several technologies are affecting the way insurance companies design and implement their information systems. Although many have been mentioned before and some are not strictly new, they represent the most recent applicable technologies that can benefit IS by either improving function or performance, or expanding the IS or insurance company's capabilities. The most important are noted below.

Expert Systems - There were some indications late in the 1980s that insurers were taking a step back from early enthusiastic experiments with expert systems to support professional workers. Now it appears that these were breaks to evaluate progress to date and set new commitments for the 1990s, including evaluation of next-generation tools coming on the market on PC and mainframe platforms. Expert systems now appear to be a key technology for the 1990s, but speed of system implementation (versus prototyping, development, and pilot-test usage) remains to be seen.

CASE Tools - CASE, for new system development (and the associated offshoots of software re-engineering for changing and updating existing systems) is a key technology for the 1990s. IBM's 1989 announcement of AD/Cycle integrating CASE tools through a central repository manager is a clear endorsement of CASE. The technology is still relatively immature and has scarcely been tested on any large scale in production-oriented shops; many challenges lie between the promise of CASE and real results. As with many potential panaceas, skeptics feel that the complexities of implementation outweigh the benefits, and benefit measurements are sometimes difficult to evaluate. Most companies agree, however, that the reduced time to bring an application from concept to reality is the major benefit.

Imaging - Image processing clearly ranks as a—perhaps the—strategic technology for the 1990s. There is a continuing concern about costs for the hardware required and the process of digitizing mountains of paper files. To date, midsized insurers have pioneered implementation of image processing, and the successes they are reporting should move large carriers to follow suit during the 1990s. The cost stumbling block, however, is not a trivial one. Complete systems range in price as high as tens of millions of dollars, and today's budgetary restraints tend not to support such levels of investment without clear proof of short-term payback. New York Life has estimated a two- to three-year payback from staffing and file space savings, but actual results remain to be seen.

Executive Information Systems - Assuming data bases are integrated under RDBMSs, a logical outgrowth would be easy-to-use executive information systems. Although the technology is ready for such systems, top management's interest and commitment are unclear—a condition not limited to the insurance industry. IS executives in the insurance and other industries feel that once the chairman, president or other senior managers have a terminal on their desk or credenza that they regularly use to gather data or make analyses, the full value of IS functions will be self-evident, and IS executives' need to justify system, function or applications improvements will diminish by an order of magnitude. The concept is similar to that expressed for implementing quality programs—once the top executives in a company accept the value of a concept (quality) or system (IS), the need to sell improvements and changes is reduced.

EDI - Though EDI use in other industries has yielded important benefits to at least some trading partners, there is no clarity yet about whether the required data formatting and networking standards—or more universal usage—will emerge for claims processing in the insurance industry during the 1990s. Federal standards for electronic Medicare/Medicaid claims are driving insurance industry use of EDI, but parallel private carrier standards are lacking. Clearly, eventual insurance EDI volumes could be very substantial under conditions of wide acceptance. On the other hand, some implementations of national health insurance could substantially block the usefulness of EDI implementation, at least under today's health insurance administration structure. One area of significant EDI implementation is the P&C business, where IVANS, a network for independent agents and carriers who sell insurance through agents, is used for 35% to 40% of all premiums processed.

ISDN - ISDN holds significant promise for integrated voice and data systems beyond the sharing of high-bandwidth leased lines already implemented by many companies for the two functions, but lacks standards and robust implementations. Like many of the other technologies noted here, ISDN is a resource waiting to be used. Unlike imaging, which is cost-driven, or EDI, which awaits broader acceptance, ISDN needs imaginative implementation to provide success stories that will motivate others. As these occur naturally, ISDN will gain natural acceptance and its use will become more widespread.

D
Organization and Budget

Insurance companies typically have had strong central (corporate) control of information systems budgets, with only isolated and limited delegation of budget implementation to individual business units or other subordinate divisions.

In 1992, overall budgets in general, and insurance IS budgets in particular, are tight. Industry estimates for 1991 IS growth ranged from 5% to 6% for all industry categories to 6% to 7% for insurance companies. INPUT estimates the 1991 budget growth at 6.4% and expects 1992 to be at about the same rate (7% over 1991) until a substantial recovery becomes a reality.

Industry estimates of IS budget size range from 1.5% to better than 2.5% of revenues from all sources. INPUT estimates the IS budget at 2% of insurance company revenues, and places the portion of the IS budget available to outside services at 20%. The 20% figure is higher than previous outside services estimates due to the removal of voice communications from the IS budget, adjustments to the salary and purchased software allocations to reflect current spending habits, and a steady increase in the use of systems operations and systems integration resources. As outsourcing becomes a stronger trend at the midsized and smaller company levels of the insurance industry, and as more agencies increase their spending for minicomputer- and PC-based resources, these figures will again change.

E
IS Department Objectives

The changes that are occurring in the insurance industry are driving an evolving set of business objectives for that market sector. The current objectives are summarized in Exhibit III-3, with an indication of the relative importance of each objective to the P&C or L&H industry segments. Increasing profitability is a primary goal for both segments, and, as a result of recent instabilities and uncertainties, the stability and safety of their investments is important to the life insurance companies.

EXHIBIT III-3

Importance of Current Insurance Company Objectives

Objective	P&C	Life/Health
Reduce Administrative Costs	Medium	Medium
Increase Insurance Profitability	Medium/High	Medium/High
Increase Investment Safety	Medium	High
Increase Revenues	Medium/Low	Medium/Low
Improve Service	Medium/Low	Medium/Low
Advance Technology	Low	Low

The efficiency of the functions performed by the IS department has a direct bearing on costs and profitability, but the contribution of IS to the efficient conduct of insurance company business activities can be difficult to measure (a truism for most industries). A recent survey of insurance IS executives identified the measurements used by their organizations to evaluate IS efficiency. These measurements are summarized in Exhibit III-4.

Although all the measurements noted are meaningful and applicable to IS performance, some—such as lines of code per month—have traditionally been difficult to quantify. Uncertainties lie in the definition of a line of code. Is it any line, a debugged line, an optimized line or the most effective algorithm for the function desired? Network/system availability is another area where effective measurement requires a consensus as to what is being measured and what thresholds are acceptable.

Efficiency is not the only measure of the contribution of the IS function to company performance, of course—it is simply the easiest to define. IS activities, through the provision of new or improved functions and capabilities, can also offer competitive advantage and help to increase revenues and market share.

EXHIBIT III-4

Insurance Industry IS Function Efficiency Measurements

- Cost displacements
- Cost avoidance
- User productivity gains
- IS expense as a percentage of premium income
- IS expense per unit of user effort
- Network/system availability
- Lines of code per work-month
- Industry chargeback statistics

Source: *Computerworld*, 1991

Based on company objectives, the plans of insurance industry IS managers, and the ongoing efforts needed to improve the efficiency of the IS function, the following are the primary objectives of the IS department, in terms of budgets, technology, the IS environment, regulatory pressures, and executive information needs.

Budgets - IS managers expect to have to control budgets to meet business profitability and IS expense objectives, while maximizing systems in the profitable years of predictable insurance industry cycles. They will establish effective (and saleable) cost-justification techniques and secure non-IS management acceptance and support of their plans and programs. In addition, IS managers seek to develop budgets that can accommodate the significant investments necessary for the implementation of RDBMS and image processing.

Technology - IS managers will continue to consider and apply expert system alternatives for the support of insurance professionals, and CASE tools for IS programming staff. They will implement imaging, as costs can be justified, and continue to support and expand the use of EDI. They expect to maintain a constant awareness of productivity tools (such as CASE) and implement those that apply to specific company needs.

IS Environment - IS managers who have not yet done so will complete the migration from a batch to an on-line environment and begin evaluating their priorities for the next evolutionary step—distributing applications off of the mainframe. They expect to integrate on-line systems and LAN-based PCs into companywide networks, distributing functions and applications as required, and allowing common access to all data, systems and resources.

Regulatory Environment - National health insurance, federal regulation of the insurance industry and tax law changes are all possible, but trying to evaluate them, especially in an election year, is a complex task and one not likely to produce usable conclusions. IS managers expect to continue to monitor these areas and wait for better data and clearer direction before factoring these topics into IS department objectives and plans.

Executive Information Systems - Most IS managers know that once top management has accepted the concept of an executive information system and uses it on a regular basis, acceptance of the value of IS activities almost always follows. Besides the intrinsic value of providing company management with access to timely performance data, executive information systems offer a subtle path to IS understanding for the non-IS manager. IS departments will continue to implement and expand this function for both business performance and IS awareness reasons.

IV

Information Services Market

This chapter discusses the markets for information services in the insurance industry. Information in this chapter draws on the statistics presented in Chapter I and the trends and issues discussed in Chapters II and III to outline the anticipated future directions of the markets for information services.

One of the key items discussed is the set of trade-offs between prepackaged solutions—such as processing services, applications software, and turnkey systems—and custom solutions that involve consulting or internal systems development and systems integration support.

User expenditure forecasts are provided for the insurance industry by industry sector and by delivery mode. Assumptions driving the forecasts are presented. Note that these forecasts do not include functional general-purpose information services, such as for human resources or generic planning and analysis. The markets for these types of information services are presented in cross-industry MAPS reports, rather than the industry-specific reports.

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

Section B, Delivery Mode Analysis, breaks out the overall data into INPUT's seven standard delivery modes.

Section C, Industry Segment Analysis, provides a breakout of this same forecast in terms of the major market segments within the insurance industry. These segments are:

- Property and casualty carriers (P&C)
- Life and health carriers, including the nonprofit, state-based Blue Cross/ Blue Shield organizations (L&H)
- Independent agents and brokerages (Agents)

A
Overview

A number of business and technical driving forces are impacting the insurance industry's use of information services in 1992 and beyond.

1. Driving Forces

Competition - Competitive pressures are continuous in the insurance industry, although for different segment-specific reasons. In P&C, insurers continue to compete aggressively on both price and service for business. On the life side of L&H, both traditional and innovative insurance products must compete with investment-oriented products and non-insurance investments such as IRAs and, in better times, high-yielding CDs. Group health competition is intensified on the revenue side by rising employer resistance to rate increases, and on the cost side by steadily escalating hospital and physicians' fees.

Customer Service - To cope with these competitive pressures, many insurers are investing in systems technologies and support services to improve the level of customer service—with customer defined either as the independent agent who must choose to sell the carrier's product versus the competition's, or as the ultimate insured with post-sale questions or servicing needs.

Access to Data - Key technologies that are driven by this push to improve customer service include RDBMSs and networked information systems to speed data access, both for executives and managers who monitor and respond to competitors, and for all levels of insurance company employees who serve customers. Strategic-level information systems—like the data base integration technologies for improving customer service—will be a key systems dynamic for the 1990s. The objective is to achieve positive competitive benefits such as faster or higher quality service or responsiveness to customers and prospective customers. Agents selling in field locations such as people's homes, for example, are finding that the laptop computer hardware and software (available at low cost in 1992 and beyond) permits instant development of a firm price quotation and can lead to a sale close on the first visit—before a competitor can provide an alternate quote and jeopardize or delay the sale.

Imaging - Image processing technologies are sophisticated new vehicles that can improve customer support by providing instant access to account information, such as letters and photographs, not generally available through the insurer's normal digital data bases. In addition, they are one of the few remaining information services technologies that can apparently be cost-justified on clerical-staffing or file-space dollar savings. The problem is that the level of investment is high enough that most potential

implementers want well-documented case studies that support savings assumptions—and few exist at this time. The need is clear, however, and the technology satisfies that need. It is only a matter of time before imaging is the common storage medium for the industry.

Expert Systems - Expert systems is another strategic technology that is and will continue to be important in the 1990s. Insurers are increasingly confident with their use of expert systems to assist professional-level underwriters and claims adjusters and are receptive to substantial new systems developments and implementations.

Systems Evolution - The 1990s will continue the management of the systems evolution that almost all insurers are following—moving from heavy reliance on central mainframes and attached dumb terminals toward more highly networked environments with far more distributed intelligence in the form of desktop systems. In most cases, the mainframe will be retained as a central data base system. New types of systems networking will be key, both for the access to data bases required to improve customer support and for use by PCs, workstations, and non-mainframe file servers as part of new company architectures for re-engineered information systems.

Application Development Efficiencies - The 1990s will also see in-house applications and data bases that evolved more or less independently during the 1970s and 1980s (within the mainframe environment) gradually brought together. They will be integrated, in part, with the assistance of CASE tools that are now part of the software development mainstream. New insurance systems (mainframe and networked PCs) increasingly will be built with CASE-tool assistance, improving the initial fit of new systems to user needs (especially through the use of CASE-based prototyping) and reducing the cost of system maintenance.

Agent Networking - Electronic networking of insurance policy data between carriers and independent agents finally appears poised for widespread implementation in the 1990s—after delays throughout the 1980s—based on new electronic standards promoted by industry standards groups. Although industry acceptance is not certain, these standards appear to have set the stage for the successful launch of a long-delayed era of flexible networking between carriers and agents.

2. Inhibiting Forces

In contrast, a number of forces inhibit insurers' use of information services, as shown below.

Continuing Tight Expense Controls - The ongoing competition cited earlier as driving new investments in customer support technologies has an inhibiting side as well: insurers are now conditioned to work in an environment of constant pressure to keep down expenses. As information systems and services pioneers, insurers are already well past the high-growth stage of investment in information technology. Today's pattern of expense control means that —with possible exceptions during years of increased profitability at the top of industrywide competitive cycles—insurers' information services budgets likely will grow no more on average, than the insurance industry's multiyear compound annual growth rate of 9% to 12%, and for the forecast period, INPUT estimates that most IS budgets will grow at a maximum of 10% annually. Trade-offs among competing information services investments will become a critical systems budget issue.

Investments in Distributed versus Centralized Systems - The new investments forecast for networked PC systems will almost certainly come from decreases in the mainframe portion of insurers' budgets. The challenge here—and also for integrating independently developed mainframe applications and data bases under RDBMSs—will be justifying such budget trade-offs when the existing systems essentially work. In other words, existing systems still accurately process the business applications and provide the data that managers and staff need, more or less as intended, if not as efficiently, flexibly, or fast as some would like. This mainframe status-quo situation will somewhat inhibit the funding of new networking and system redevelopment projects in the 1990s.

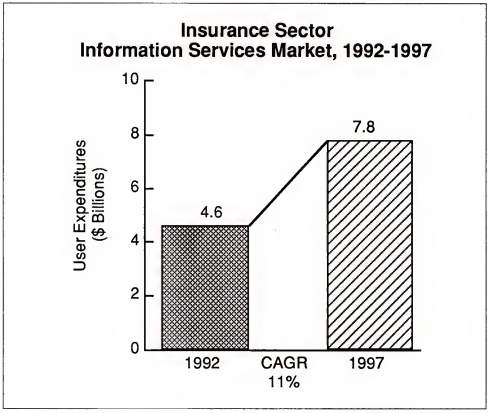
Intangible Benefits of Better Management Systems - Similarly, the new strategic systems being proposed rarely show direct cost savings. Rather, they require new, more qualitative forms of cost justification. Management must learn how to value and budget for intangibles such as enhanced professional support and improved customer service. Until such new cost justifications are routine for insurers, the difficulty of winning budget allocations will be an inhibiting force on such new systems.

Agent Networking Dilemma - Even the new standards for downloading to independent agents outlined earlier does little to change the networking incentive structure from the carriers' point of view. Carriers will continue to resist significant investments in flexible, multipoint agency networking (as opposed to one-to-one telecommunications links), on the theory that this will encourage agents to "shop the carriers" electronically to get the most attractive treatment possible for their insureds, just as agents do by mail and telephone today.

3. Information Services Market

Based on these driving and inhibiting forces, INPUT projects the 1992 to 1997 information services market for the insurance industry as shown in Exhibit IV-1.

EXHIBIT IV-1



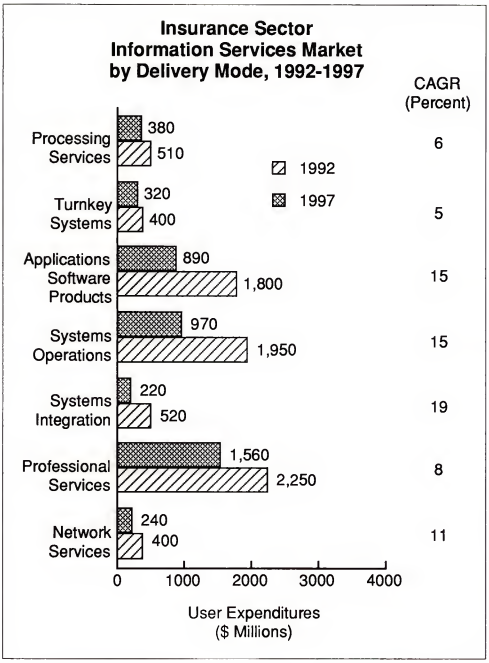
Year-by-year detail is shown in the forecast data base (Appendix B). In building these forecasts, INPUT estimates that 1992 expenditures will be a modest 7% greater than 1991, moving to 9% in 1993 as a sustainable recovery becomes evident and budget restrictions start to ease. After years of budget constraints, a healthy economy will trigger a reactionary 15% increase in spending in 1994, as pent-up demands are satisfied, followed by a gradual decline to 12% in 1995 and a return to a steady growth of 10% per year in 1996 and 1997.

B

Delivery Mode Analysis

As shown in Exhibit IV-2, there continue to be significant differences projected in five-year growth rates for the information services delivery modes to the insurance industry.

EXHIBIT IV-2



For reasons detailed in the individual delivery mode discussions that follow, over half the delivery modes are expected to show five-year growth rates in excess of the industrywide information systems CAGR of 8%.

1. Processing Services

The insurance industry's use of processing services was established relatively early and has grown steadily over the years. This delivery mode primarily represents the insurers' use (over telecommunications connections) of remote mainframe-based data centers, generally for policy processing and administration. The bulk of processing services use for the insurance industry is by midsized or small insurers who need advanced software and hardware facilities to handle their core record-keeping functions, but choose to avoid major investments in mainframe resources and internal staff. Some volume is also in specialized processing—for example, for unusual and small-volume lines of insurance—accessed by large as well as small insurers.

Note that a substantial portion of the processing services business derives from the specialized business of Medicare/Medicaid processing, generally contracted for through the Blues (Blue Cross) in the case of federal Medicare (which requires an insurance carrier to be the prime contractor) and through state governments in the case of state-administered Medicaid programs.

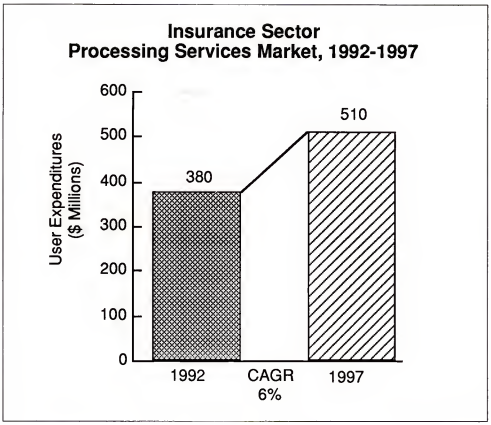
Similarly, the Blues tend to outsource processing, either to Electronic Data Systems (the leading vendor by far) or to multistate associations of Blues that set up processing operations, some of which Electronic Data Systems operates as a facilities manager.

Exhibit IV-3 shows the growth expected in processing services.

Although the processing services market in the insurance industry will continue to grow during the period, its growth rate is declining. The key reason is the steady increase in the processing power of PCs, workstations, and network-based file servers—and the growing body of insurance-specific software for each of these platforms. This evolution increasingly permits smaller insurers to cut yearly processing service costs by investing in this new generation of in-house systems, which are far less costly to purchase and operate than the mainframe systems required in the past. Similarly, an insurer of any size now can operate inexpensive specialized software systems for more and more specialty lines of business on such non-mainframe platforms.

Processing services had a 5% increase in expenditures in the insurance industry between 1991 and 1992, growing from $363 million to $380 million. Expenditures are expected to grow at a modest CAGR of 6% through 1997 to $510. A continuing increase in processing work is being handled by established vendors such as Policy Management Systems and ADP (collision estimating), but there do not appear to be significant new sources of business to increase the growth rate of processing services

EXHIBIT IV-3



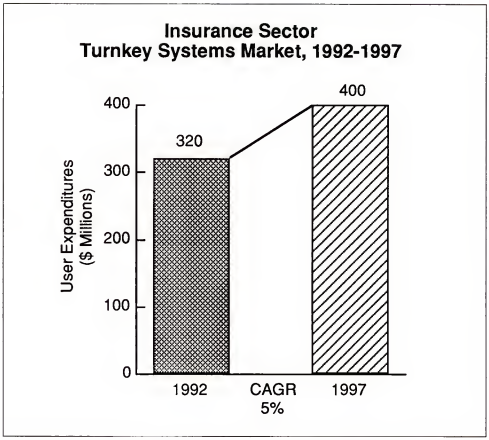
beyond the relatively modest rate noted. However, the steady rate of growth for processing services suggests that there is not a significant trend to replace these services with turnkey systems or software products that will save costs as a result of invoking workstation/PC solutions.

2. Turnkey Systems

Turnkey systems provide an easy-to-implement solution by bundling the required hardware and software into a single package, but generally at the price of limiting flexibility for the user. Turnkey systems place the user more at the mercy of the vendor. Historically, turnkey systems have been based on minicomputer hardware platforms and have been most frequently used by smaller firms with simpler operational needs—companies that cannot afford or choose not to invest in the overhead of their own mainframe-based data processing capabilities.

Exhibit IV-4 notes the growth expected in turnkey systems.

EXHIBIT IV-4



User expenditures for turnkey systems grew at 5% between 1991 and 1992, and are forecast to grow at that rate between 1992 and 1997. This rate of growth—less than that of processing services—is the slowest rate of delivery mode growth in the insurance industry.

The increase in expenditures from $301 million in 1991 to $320 million in 1992, and then to a forecast level of $400 million in 1997 is also the smallest absolute increase among service modes. (Network services will also reach $400 million in 1997, but starts from a lower 1992 base.) Insurance and health are the two industries with the lowest level of growth for turnkey systems between 1992 and 1997. This low growth is caused, to a large extent, by the growth of applications software products for workstations/PCs, and IBM's shift to direct hardware sales to end users in support of its business-partners software packages. This approach does not provide any incentive to the partner to bundle software and hardware into a turnkey package under the partner's name.

3. Applications Software Products

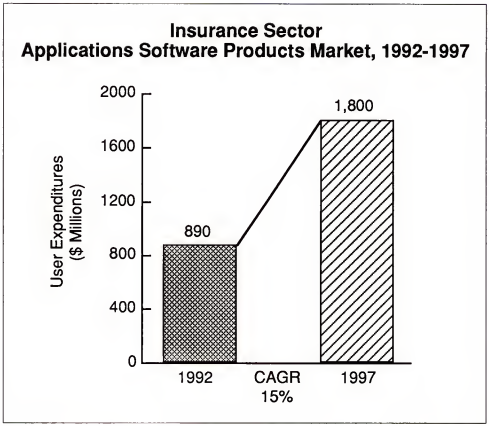
The insurance industry presents a mixed picture in terms of purchases of software products. Most very large carriers maintain substantial in-house staffs of programmers to develop and maintain company-unique applications for their large mainframe operations. Frequently, large carriers are disinclined to purchase applications software packages because packages purportedly are not adequate to meet unique company needs. Carriers below the top tier may develop software, purchase packages, or use processing services to meet their information services needs, often evaluating all options in a specific situation. When choosing to purchase software, these carriers contract with the vendor or others for the modifications required to make software meet specific needs. Size, followed by company culture, seems to determine which approach is most often used by a specific company.

Agents rarely develop their own software, generally purchasing off-the-shelf systems (historically minicomputer-based but increasingly networked-PC-based) or accepting carrier-provided agency automation systems, either paid for by the agency at something approaching fair value or provided at low or no cost by the carrier in exchange for commitments to steer major portions of business to the carrier. The larger brokers, like the larger carriers, consider their needs more unique and will more often develop—or contract for a consulting firm to develop—broker-unique software systems.

As noted in the earlier discussion of processing services, the key new trend in the software products delivery mode is the availability of more and more non-mainframe software solution packages, generally for networked PCs. This new option—plus the relentless pressure on profits from high levels of insurance industry competition, pressure that dampens management support for expensive in-house software development projects—is fueling growth in applications software beyond that in most other delivery modes. Software products for insurance would grow even faster, however, if there was not a reservoir of in-house resistance among top carriers.

Exhibit IV-5 shows the growth expected in the applications software products market.

EXHIBIT IV-5



Expenditures grew at a rate of 8% between 1991 and 1992 for applications software products, going from $826 million to $890 million. The CAGR will rise to 15% between 1992 and 1997, and expenditures will grow to $1.8 billion in the final year. The growth of expenditures is forecast to be higher—23%—for workstation/PC software products, while rates for mainframe and minicomputer applications software products will be 7% and 3%, respectively. Forecast expenditures will be highest, $1.2 billion, for workstation/PC applications software products in 1997. In fact, expenditures will be more than twice as much as the sum of the expenditures for minicomputers and mainframes.

The trend in favor of insurance industry software products will accelerate during the period as networked PC and workstation platforms become more powerful, off-the-shelf packages increase in flexibility to adapt to a firm's particular needs, client/server applications proliferate, and success stories are reported.

4. Systems Operations

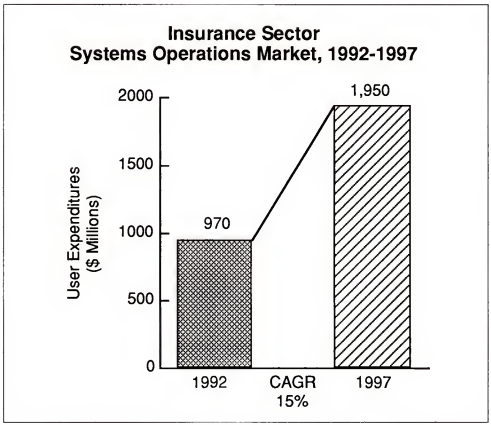
The insurance industry's leading carriers generally have resisted operation of their in-house mainframe computer systems by outside firms. Given the concept of an insurance company as an information factory, information systems are at the heart of the insurer's or agent's business, and thus generally are managed in-house, not by outsiders.

Two forces are at work to expand insurers' use of systems operations services. First is the cross-industry trend to return to core business activities (e.g., insurance, not information systems), an analysis which often leads to the conclusion that an outside contractor could cut costs, free up valuable internal resources, and perhaps provide better service. Traditional hardware vendors such as IBM are expanding their role in such systems operations services.

Second, just as systems integrators may be necessary to help a firm evolve to higher levels of systems complexity and to bring together new technologies, more insurers are expected to conclude that managing the new level of complexity once it is installed is not a good use of corporate resources.

Exhibit IV-6 indicates the growth expected for systems operations over the forecast period.

EXHIBIT IV-6



In 1991, systems operations was the fastest growing delivery mode at 11%, and from 1992 to 1997 it will continue to be one of the fastest growing, with a CAGR of 15%. INPUT forecasts systems operations (SO) to have almost four times the user expenditures of systems integration, the fastest growing delivery mode between 1992 and 1997. SO has the added user benefit of reducing the investment that a company has to make to upgrade IS technology. This benefit will continue to be important in the insurance industry in view of ongoing financial concerns.

5. Systems Integration

The market for systems integration 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, seldom bearing 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.

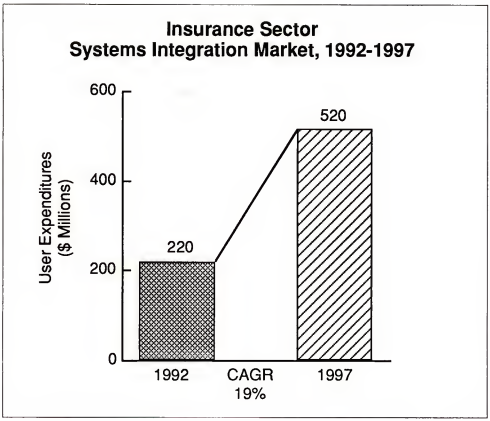
The complexity of today's information services technology and the accelerating pace of technical change make it increasingly difficult for an insurer to manage large new-systems projects, especially those requiring a combination of in-house and outside resources. As a result, more firms are beginning to transfer the risk and responsibility to systems integration firms.

Exhibit IV-7 shows the growth expected in systems integration.

In 1992, expenditures for systems integration will grow at a rate of 9% and increase from $201 million in 1991 to $220 million in 1992. The growth rate dropped between 1990 and 1992 as contracts were delayed (and continue to be delayed) due to the impact of the recession and the financial condition of insurance companies. Expenditures will grow at a higher rate, a 19% CAGR between 1992 and 1997, and reach $520 million at the end of the five-year period. This growth rate will be the highest among all delivery modes during the planning period. The rapid growth of systems integration and systems operations indicates the value that users place on this capability, and the high level of interest these users have regarding information services vendors with experience in the insurance industry and the capability to support complex systems.

At present, systems integration is the smallest of all delivery modes, in part as a result of a scarcity of professionals with the skills and experience necessary to do the job. During the forecast period, in addition to the re-architecting of large systems discussed under professional services—especially for the integration of networked PCs and workstations—many

EXHIBIT IV-7



systems integration projects will involve the introduction into an insurer's workflow and operations of major new technologies such as image processing and expert systems. The system integrator's experience with the technology will be of special value when the insurer has no direct experience in-house.

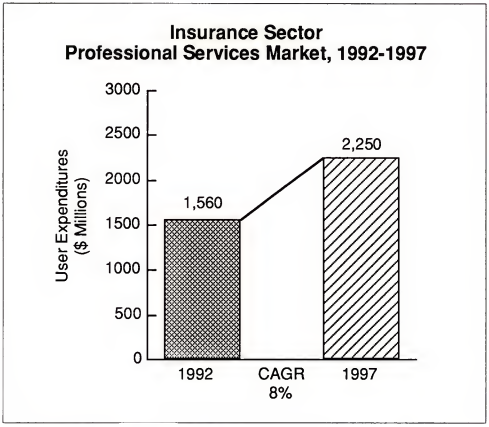
6. Professional Services

Insurance industry use of professional services—generally by the larger carriers and brokers—falls into two categories. Historically, large consulting firms specializing in information services have developed large (and more or less unique) mainframe-based software systems in consultation with the carrier's or broker's systems staff. This business has become less significant, as increasing portions of the revenues derive from more architecturally oriented consulting. Carriers and brokers with large systems still look for expertise in adapting off-the-shelf applications to meet their needs, but the greater emphasis is on general consulting and systems architecture advice on the wide range of new technologies and options now available—most notably the challenge to mainframe-based systems presented by networked PCs and workstations. While bridging into

systems integration, the professional services side of such consulting involves activities such as systems evaluation, overviews of technologies and new technical options, and recommendations on re-engineering a large systems operation.

Exhibit IV-8 shows the growth expected in professional services.

EXHIBIT IV-8



Professional services will grow at a rate of 5% in 1992 as user expenditures increase from a level of $1.49 billion to $1.56 billion. The CAGR is forecast to rise to 8% between 1992 and 1997, while user expenditures grow to $2.25 billion. Growth in the CAGR (to 8%) will be driven by the increasing use of consulting and education and training services rather than the use of professional services for software development. Since consulting services will often be provided by Big 6 firms and other systems integrators, and professional services will be provided to modify turnkey and software product solutions by SI, SO, turnkey and software product vendors, there could be a decrease in the professional services revenues of some vendors (or specific vendor offices) that develop systems or do software development for insurance companies.

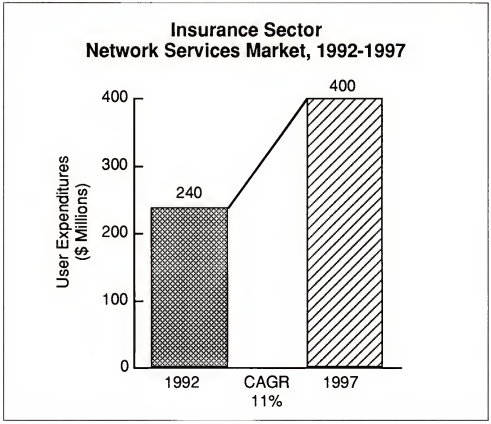
7. Network Services

Despite their far-flung requirements for local or regional operations, insurers typically have not made heavy use of the general-purpose value-added packet network services offered by vendors such as BT/Tymnet and Telenet. Similarly, the response to IBM's industry-sponsored IVANS—the Insurance Value-Added Network Service—has been underwhelming. Instead, insurance carriers typically have leased telephone lines to support relatively predictable patterns of data communication between remote locations and the home office or for data exchanges with a limited number of high-volume agents and brokers. High-capacity lines and multiplexers are further decreasing the appeal of value-added network solutions.

The more significant use of network services by insurers is for the growing body of electronically accessed information services. Generally this is risk-related information, such as a driver's motor vehicle violation history, used by the insurer at the time of underwriting to determine whether to accept a risk and at what rate. More and more such information is available to insurers from a growing body of vendors, some of whom are dedicated to that service, and others who are making major strategic thrusts into it.

Exhibit IV-9 notes the growth expected in network services.

EXHIBIT IV-9



Network services will grow from $221 million in user expenditures in 1991 to $240 million in 1992. Between 1992 and 1997, expenditures are forecast to grow at a CAGR of 11% to reach $400 million in 1997.

The electronic information services submode will increase at a rate of 11% between 1992 and 1997, driven by the use of on-line data bases for underwriting new business and adjusting claims. Network applications growth will be slightly less, at a rate of 9% between 1992 and 1997.

C
Industry Segment Analysis

Exhibit IV-10 shows INPUT's segment-by-segment forecast for the insurance sector. Exhibit IV-11 notes how the growth rate of these expenditures will change over the forecast period.

EXHIBIT IV-10

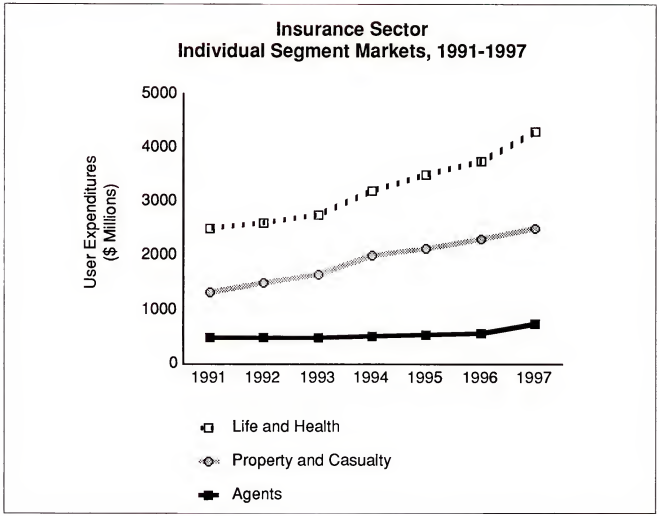
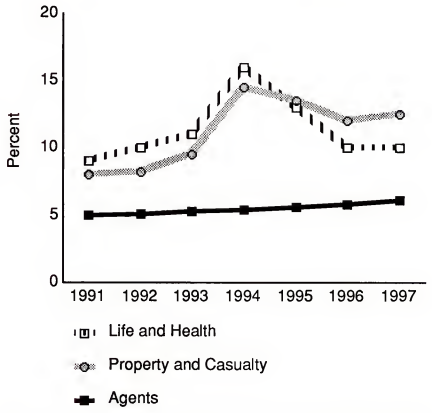


EXHIBIT IV-11



Overall Growth (%)	-	7	9	15	12	10	10

The primary factor driving the growth of information services expenditures is the overall revenue growth within each segment, given that information services expenditures for the most part will be a relatively constant percentage of revenues for this relatively mature information services market.

The variable growth rates shown for the property and casualty and the life and health carriers reflect their initial reaction to the anticipated sustained recovery expected in late 1992 and 1993. This will be followed by a slow return to a higher steady growth rate, as the euphoria of reduced budget constraints in 1994 and 1995 gives way to somewhat higher growth as imaging and other new technologies are added and begin to refresh this market.

The steady but low growth rates for independent agents and brokerages reflect their participation in the L&H and P&C fluctuating business cycles and the growing direct-writing trend, which will diminish independent agents' and brokerages' participation in the overall industry's average rate of growth.

V

Competitive Environment

This section discusses the competitive environment for information services within the insurance industry. Leading vendors are identified and representative vendors are profiled.

A
Vendor Characteristics and Competitive Trends

As in the insurance industry itself, a small number of information services vendors dominate sales of software, systems, and services to the insurance industry. For example, the top two vendors in insurance processing services, Policy Management Systems Corporation and Electronic Data Systems, together account for nearly half of the industry's purchases in that delivery mode. Even more striking, one vendor, Equifax, accounts for over three-quarters of network services revenues. Almost 60% of applications software revenue is controlled by two vendors, with corresponding concentrations for the other delivery modes.

In most cases (with the exception, in the leading-vendor category, of Electronic Data Systems), large and small information services vendors selling into the insurance industry are exclusively or very highly concentrated in this industry. Often they draw key personnel from the insurance carriers or agencies for their operational expertise, and the knowledge they maintain and continuously extend about the specialized world of insurance operations is regarded as an important competitive asset.

With a few large vendors dominating most sectors of the business, and thus serving the industry's generalized needs that are common among a large number of firms, smaller vendors selling into the insurance industry tend to offer more specialized, niche products. Examples include software packages that apply particularly to specific L&H products such as annuities or pension management, or network services that provide information updates specific to the insurance of mortgaged properties or automobiles with outstanding liens.

In general, the largest vendors have given lower priority to agents as a separate market. This reaction has been driven by two recent trends:

- *Use of PCs* - Classic turnkey systems have been greatly impacted by PC-based software. Some general-purpose PC software—e.g., word processing, sales tracking, and accounting—has proven to be viable as a foundation for tailoring for insurance agents.

- *Insurance Company Support* - Individual insurance companies have offered more information service-based support to their agents. At one time, company-independent offerings were expected to be more competitive than has proven to be the case.

B
Leading Vendors

The overall competitive structure has not changed significantly in terms of relative revenues. As a result, the largest vendors, as shown in Exhibit V-1, have retained their relative positions.

The larger vendors continue to offer products and services to the major insurance company segments, as shown in Exhibit V-2. Companies strong in one segment—e.g., Policy Management in P&C or Continuum in life—have entered new segments by acquisition. See Exhibit V-3 for a representative list of recent acquisitions.

EXHIBIT V-1

Leading Vendors to the Insurance Sector

Vendor	1990 Revenues ($ Millions)
Electronic Data Systems (EDS)	500
Policy Management Systems (PMS)	346
Equifax	310
Andersen Consulting	130
Continuum	100
ADP	80
ISI Systems (Div. of Teleglobe)	50
Dateq	45
Warner Insurance Services	40
IBM	30
Cybertek	27

Source: Company reports, INPUT estimates; data calendarized

EXHIBIT V-2

Leading Vendors
Major Segment Focus

Company	Life	Health	Property/ Casualty	Agents
EDS	X	X	X	
PMS	X	X	X	
Equifax	X	X	X	
Andersen Consulting	X	X	X	
Continuum	X	X	X	
ADP			X	
ISI			X	X
Dateq			X	
Warner Insurance Services			X	
IBM			X	X
Cybertek	X			X

Source: INPUT analysis

EXHIBIT V-3

Recent Acquisitions by Selected Insurance-Focused Information Services Vendors

Acquirer	Company Acquired/Business	Date
Allied Information Services	Freedom Group/PC-based annual statement processing	1/91
Cedar Rapids Software Services	ISI divestiture/V4 P&C software product	2/91
Continuum	Syntelligence/Expert system software	4/91
Continuum	Computations/P&C software	6/91
CPS	Swiss Reinsurance divestiture/ CAPSCO PALLM P&C software	2/91
Cybertek	Cogensys/Expert system software	3/91
Policy Management Systems	PMS Inc./Physician insurance data	11/90
Policy Management Systems	Management Data Communications/ Group health software and processing	1/91

On the whole, however, vendors have been cautious about moving out of their established delivery modes, as shown in Exhibit V-4. PMS, the only vendor to have major offerings in all delivery modes, has been established in those modes for about ten years and has been in all modes (except network services) since its founding.

Note that in the acquisitions reported in Exhibit V-3 there were none that moved a vendor into a new delivery mode.

EXHIBIT V-4

Leading Insurance Vendors
Major Offerings by Delivery Mode

Company	Turnkey/ Software Products	Processing	Professional Services/SI	Systems Operations	Network Services
EDS			X	X	
PMS	X	X	X	X	X
Equifax					X
Andersen Consulting			X		
Continuum	X	X	X		
ADP					X
ISI	X	X			
Dateq					X
Warner		X		X	
IBM				X	X
Cybertek	X	X			

Source: INPUT analysis

C
Vendor Profiles

This section contains profiles of representative information service whose primary focus is the insurance industry. Companies profiled include:

- Continuum Company, Inc.
- Cybertek Corporation
- Electronic Data Systems
- Equifax
- Policy Management Systems Corporation
- Warner Insurance Services, Inc.

1. Continuum Company, Inc., 9500 Arboretum Boulevard, Austin, TX 78759-6399 (512) 345-5700

The Continuum Company provides applications software products, processing services, and professional services to the insurance industry. The company's principal product, the CLIENT/CONTRACT ADMINISTRATION™ (CCA) system, supports the administration and marketing of individual life, health, and annuity insurance policies.

INPUT estimates that over 85% of Continuum's fiscal 1991 revenue was derived from its various professional services, 6% was derived from software licenses, and 9% from processing services.

In October 1990, Continuum acquired Computations Holdings Limited of Australia for approximately $11 million. Computations provides applications software products and professional services to life and property and casualty insurance companies.

- The acquisition extended Continuum's market to include property and casualty insurance companies. It also provided Continuum with new offices in Australia, Denmark, and Norway, and substantially increased its presence in Europe.

- Computations had approximately 300 employees at the time of the acquisition and annual revenue of about $32.5 million. Its operations have been merged into Continuum.

In April 1991, Continuum announced Enterprise Solutions by Continuum (ES/C). The ES/C strategy includes developing standardized interfaces to the various modules of CCA and Continuum's other products to permit the integration of Continuum products with each other and with in-house and third-party systems.

2. Cybertek Corporation, Suite 600, 7800 North Stemmons Freeway, Dallas, TX 75247-4217 (214) 637-1540

Cybertek Corporation, founded in 1969, specializes in products and services for the life insurance industry. The company provides applications software products and associated support services, processing and systems operations services, and professional services. Cybertek's revenues are divided almost equally between software products and related services and processing services. The current customer base includes approximately 100 life insurance companies.

In March 1991, Cybertek acquired Cogensys Corporation of San Diego, CA. Cogensys is the developer of the Cogensys Judgment Software™ expert system. The software will be used by Cybertek customers to aid in underwriting and other decision-making processes. Cogensys had approximately 25 employees at the time of the acquisition and annual revenue of approximately $2 million.

Cybertek's product strategy, Enterprise Vision™, foresees the integration of the methods, systems, and functionality necessary to expedite the information-gathering and data processing functions of the four major constituencies that make up the insurance enterprise—the insurance customer, the field force, the home office, and the information providers (inspection services, clinical laboratories, doctors, etc.). The strategy incorporates expert workstation software, a central repository of data, a seamless communications network, and system design and maintenance.

3. Electronic Data Systems (EDS), 7171 Forest Lane, Dallas, TX 75230 (214) 604-6000

The EDS division of General Motors is universally recognized as the leading force in insurance industry processing services and systems operations. Among the Blues, for example, EDS is the processing service vendor or on-site computer systems operator for many of these state-based nonprofit health insurers. To take another leading example, one processing service provided by EDS to many Blues is the administration of the computer systems required to implement the Blues' contracts with the federal Medicare program for Medicare claims processing (or benefits administration). In parallel, EDS contracts with 17 states to process Medicaid claims under the specific terms defined by each state, representing about two-thirds of total Medicaid claims volume.

EDS's products and services include "technology management," processing services, and software products. Technology management by EDS incorporates professional services consulting to determine a firm's needs, systems integration services to install the required software and systems, and systems operations or processing services as required. Remotely accessed processing services are the mainstay of the EDS insurance industry business, especially in the claims processing areas outlined earlier. Several software products—including one based on expert systems technology—are offered for administration, processing, rating, and underwriting insurance functions.

About half of EDS's $500 million in 1990 insurance industry revenue derived from processing services, with 20% each from systems integration and systems operations services, and 10% from software products.

As mentioned, EDS participates in the emerging technology of expert systems, based on a company acquisition and on leveraging of work done for its parent, General Motors. Current capabilities in personal P&C underwriting will be extended into administrative and rating systems. The firm also provides image processing systems for health applications.

EDS sees major new competitive players entering the systems integration market, such as IBM and leading CPA-based consulting firms. EDS's competitive advantages derive in part from size—data centers around the U.S. and a presence in over two dozen countries—and longevity. Many observers regard EDS as the most successful pioneer of remote processing services and systems integration, and the skill set it can call on at all levels is one of the best in the industry.

4. Equifax, 1600 Peachtree Street, N.W., Atlanta, GA 30309 (404) 885-8000

Equifax provides the insurance industry primarily with network-based information services, plus some professional services that include investigation and reporting for insurance-related functions.

Equifax's primary electronic services for insurers are its underwriting and claims information services, with which a carrier can access information on an applicant or an insured prior to underwriting the risk or in the course of investigating a claim. Another service takes the pooled information on claims provided by subscribing carriers and makes it available interactively to a subscriber investigating a claim from a particular insured. Non-electronic services to insurers include loss control inspections and health screening, such as medical testing and reporting.

About 43% of Equifax's 1990 revenues of $1.1 billion were from the insurance and special services unit of that company, with approximately two-thirds of that amount ($310 million) attributable to electronic information services for the insurance industry.

Equifax uses RDBMS technology as the basis for the pooled exchange of information. Whatever the form of the information as entered, it can be accessed electronically by another insurer as required.

Though not alone in providing networked information services to insurers, Equifax has a dominant position in this arena. Equifax's competitive position is due to the fact that it has grown up with the insurance industry since its first L&H report in 1901, and started providing automobile-related reports as soon as auto insurance became a business. It has evolved with the industry and applied technology as appropriate, including the electronic networking of information, an area in which it is the leader.

5. Policy Management Systems Corporation (PMSC), P.O. Box Ten, Columbia, SC 29202 (803) 735-4000

Policy Management Systems Corporation (PMSC) provides processing, electronic information services, applications software products, and associated support services to the insurance industry. PMSC was formed in 1974 as the PMS Division of the insurer Seibels, Bruce and Company.

Prior to 1989, PMSC and IBM had worked together under various agreements. In 1989, this relationship was strengthened through IBM's acquisition of a 19.8% minority equity interest in PMSC for $116.8 million. As part of this transaction, IBM and PMSC agreed to work closely together to develop and market automated solutions for the insurance industry.

Recent acquisitions made by PMSC include:

- In January 1991, PMSC acquired Management Data Communications Corporation (MDC) for $5.9 million. MDC provides applications software and processing services to the group health insurance industry.

- In November 1990, PMSC acquired PMS, Inc. of Waco (TX) for $9.1 million. PMS provides attending physician statements and personal history interviews to the life and health insurance industry throughout the U.S.

- In November 1989, PMSC acquired Advanced System Applications, Inc. (ASA) of Bloomingdale (IL), which provides software and processing services to the group health insurance industry. ASA had approximately 700 employees at the time of the acquisition and 1988 revenue of $48.7 million.

PMSC is organized into five groups:

- The Industry Markets Group, responsible for marketing the company's property and casualty and life products and services

- The Technology Solutions Group, responsible for all Canadian operations

- The Financial Markets Group, responsible for all Asian and Pacific operations and for providing the development and implementation of life and health systems and services in addition to sales and marketing of the company's health products

- The Insurance Services Group, responsible for property services, automobile services, and third-party administration marketing and services

- The Operations Group, responsible for the day-to-day operation of PMSC, its headquarters and data center, financial and legal services, physical facilities, and personnel and employee development

6. Warner Insurance Services, Inc., 17-01 Pollitt Drive, Fair Lawn, NJ 07410 (201) 794-4800

Warner Computer Systems, Inc. officially changed its name to Warner Insurance Services, Inc. on March 19, 1992. The change was made to better identify the company with its primary insurance industry-related services. Warner, founded in 1971, currently provides systems operations and processing services to the insurance industry, principally in the assigned-risk automobile insurance category as a third-party administrator of automobile insurance policies for the State of New Jersey.

The company provides access to a range of financial data bases used by the financial community—banks, brokerages and private investors. This service represents under 10% of Warner's total business.

Through December 1990, Warner also provided microcomputer sales and hardware maintenance services to users of its financial data bases and to the general business community through its Microcorp subsidiary. These operations were discontinued by the company due to sales and margin problems. Microcorp generated revenue of approximately $10 million in fiscal 1990.

VI

Conclusions and Recommendations

A
Industry and IS Market Conclusions

The insurance industry is relatively stable—albeit with cyclical profitability, changing patterns of life-product offerings and agent-based distribution systems, and some midterm uncertainties like AIDS costs and national health insurance—and those information services vendors that are already well established in the insurance market should be able to adapt smoothly to the ongoing business and technical changes outlined in earlier chapters. Market growth is reasonable, if not strong, and opportunities clearly exist to take strong positions in the important technologies cited.

Vendors not already established in selling to insurance companies almost certainly will encounter the same "clubby" atmosphere that exists among the insurance carriers. Newcomers probably will be regarded with suspicion or at least uncertainty, so establishing early and credible references from satisfied insurance customers will be critical to industrywide acceptance.

B
User Issues and Recommendations

The key business issues faced by insurance industry information services users are outlined in Exhibit VI-1.

Slow Economy - The continuing effects of the slowed U.S. economy will make businesses cautious in their expenditures of funds for information services, information technology, and virtually all categories of business expense. The junk bond portion of investment portfolios has taken a beating, but in some cases has bottomed out and is becoming a surprising asset. Commercial real estate continues to be depressed in value, but in early 1992 is showing some small signs of recovery in regional markets. Sales of insurance also continue to be down, but as a sustainable recovery is established, both business and individual insurance purchases can be

EXHIBIT VI-1

Key Business Issues for Users

- The continuing effects of a slow economy
- Global market opportunities
- Federal regulation
- Rising health care costs
- Competition from banks and other financial institutions
- High levels of employment

expected to increase. As a result of these various pressures on insurance company performance, there have been some ratings downgrades by firms such as A.M. Best. The downgrades, however, appear more a reaction to a growing conservatism in the determination of ratings than to any significant intrinsic weakness in the industry.

Global Market Opportunities - The increasingly global nature of business is creating both threats and opportunities for U.S. insurance companies. Most consider the benefits to be predominant and look to the competitive advantages of a broader risk base and the ability to expand their services to international markets.

Federal Regulation - Will it happen and when? This could offer a significant change in the regulatory climate in which insurance companies do business; however, federal regulation does not seem likely to be a major issue in an election year, so most companies are anticipating continued state control in the near term, while keeping an eye on federal government activity.

Rising Health Care Costs - This is a major concern for the medical profession, the insurance companies, and each individual who requires some type of heath care. Efforts to control costs at all levels will continue and managing this area of the economy is expected to be a major concern for years to come. A federal health program is a possibility, but not in the near term.

Competition from Financial Institutions - Banks and other financial institutions offer a new and potentially strong competitive threat. The question is will the banks be content to simply sell insurance underwritten by others, or will they seek to underwrite it themselves? The impact of any bank participation in this market will, at least initially, be felt on a state-by-state basis, due to the current state-oriented regulatory environment.

Employment Levels - Employment levels in the insurance industry peaked in 1991. Most companies plan cutbacks over the next few years and the impact of these actions, especially on overall industry financial performance, should be positive.

Key technology issues faced by insurance industry information services users are outlined in Exhibit VI-2.

EXHIBIT VI-2

Key Technology Issues for Users

- Aging of the installed mainframe base
- Better use of agent/broker systems
- Isolated applications and data bases
- Integration of networked PCs
- Expanded use of expert systems
- Application of CASE technology to software development
- Imaging
- Expanding EDI activities

Aging Mainframes - Most insurance companies have large, sophisticated processing resources that, in many cases, represent technology that is one or two generations old. Although these resources are useful and productive assets, batch systems are being steadily replaced with on-line systems, which, in turn, will give way to decentralized systems delivering distributed functions and applications via networks to remote minicomputers and PCs. This environmental and architectural evolution is fully supported by technology and reflects the changing needs of the insurance industry.

Agent/Broker Systems - Insurance companies need to find ways to increase the automated portion of their interactions with brokers and agencies. The business benefits to both agent and insurer must be emphasized, and standards adopted that allow broad insurer access from a single agency system. Insurers must find ways to deal with an agent's desire to obtain multiple quotes other than trying to isolate them technologically on company-specific dedicated minis or micros.

Application and Data Base Isolation - Isolated applications and data bases must be consolidated into company processing environments so that the information and function is available to all interested users. Unnecessary redundancy should be eliminated.

PC Integration - Insurers will be driven to make better use of their mainframes and networked PCs, in many cases achieving this by off-loading functions to networked PCs, workstations and minicomputers. Systems organizations will be challenged to plan and implement appropriate systems architectures.

Expert Systems - No longer a pioneering or new concept, expert systems are especially applicable to many insurance company functions, such as underwriting, claims analysis and fraud detection, and the use of such systems will become commonplace in the 1990s.

CASE Tools - The ability of CASE tools to improve the software development function is generally accepted by IS professionals—the question is mainly one of specific benefit measurements. The need to renovate and re-engineer old systems and applications, and develop new ones to meet new needs, is the ideal environment for CASE. Users will find that the shortened concept-to-delivery times possible with CASE will be justification enough for their use.

Imaging - Imaging is the perfect technology for the insurance industry. It addresses one of the industry's major problems, paper proliferation, and offers a technological solution to access, control and storage needs. Costs for large, centralized imaging systems are the current stumbling block, but these will be resolved—either through cost reductions resulting from increased sales volumes (of imaging systems) or verifiable cost benefits from implementation driven by competitive pressures and profit concerns. Either way, imaging is a concept whose time has come.

EDI - Like imaging, EDI is a technology waiting to be used, but unlike it, EDI requires cooperative effort to implement effectively, and at the present time, the absence of insurance-carrier EDI standards and a general uncertainty about EDI implementation make its growth in the 1990s

unpredictable. Medicare/Medicaid and P&C claims processing through IVANS will remain the primary insurance EDI application for the next few years, with others inevitably following as needs dictate and standards are set.

Recommendations that derive from the issues outlined in this section are summarized in Exhibit VI-3.

EXHIBIT VI-3

User Recommendations

- Maximize the benefits of evolving technologies such as RDBMSs and networked PCs by applying them across all applicable company functions and not just in a limited number of areas.
- CASE tools and expert systems will help your business develop applications faster and conduct professional evaluations more efficiently—both useful attributes in an industry that will be reducing staff over the next few years.
- Plan for and implement image processing. It is the single technology most likely to benefit the industry for the next few years. Costs, at the moment, are significant, and the most logical implementation is in a centralized environment.
- Develop an information technology strategy that recognizes the general aging of existing mainframe resources and charts a path to better use of distributed architecture with centralized data bases and networked PCs. Sell top management on the benefits and the budgets.
- Sell top executives on the use and benefits of executive information systems. Place a PC, workstation or terminal on their desk or credenza and work with them until they are comfortable with its use. Then let *them* sell *you* on the next application, system or functional enhancement or upgrade that they feel is necessary.
- Service is important, both for clients and agents. Find a low-risk way to network more flexibly with key agents, and continue to improve service and response to meet client needs.

C
IS Vendor Issues and Recommendations

Recommendations for information services vendors derive from the same set of issues noted earlier in this chapter, and are summarized in Exhibit VI-4.

EXHIBIT VI-4

Vendor Recommendations

- Work with users to develop new cost justification models for strategic systems. Develop systems solutions that recognize the move toward distributed and networked functions, and away from the large, centralized mainframe environment.
- Mainframe-based vendors: Set a strategy to deal with the era of networked PCs.
- Leverage products' roles in the key technologies of image processing, RDBMSs and PC networking.
- Expert systems and CASE vendors: Secure the user's commitment to implement, not just to test.
- Agent-networking vendors: Offer value to the agent without threatening the carrier.
- Where feasible, include customer service benefits in product planning and positioning.

A

Definitions

No industry-specific definitions have been used in this report.

See the separate volume, INPUT's *Definition of Terms*, for general definitions of industry structure and delivery modes used throughout INPUT reports.

B

Forecast and Data Base Reconciliation

Exhibit B-1 presents the detailed 1991-1997 forecast for the insurance sector.

EXHIBIT B-1

Insurance Sector
User Expenditure Forecast by Delivery Mode, 1991-1997
($ Millions)

Delivery Modes	1991 ($M)	Growth 91-92 (%)	1992 ($M)	1993 ($M)	1994 ($M)	1995 ($M)	1996 (M)	1997 ($M)	CAGR 92-97 (%)
Sector Total	4,275	7	4,575	4,985	5,730	6,415	7,055	7,822	11
Processing Services	363	5	381	393	434	459	482	506	6
- Transaction Processing	363	5	381	393	434	459	482	506	6
Turnkey Systems	301	5	316	331	344	358	374	396	5
Applications Software Products	826	8	891	994	1,188	1,394	1,590	1,819	15
- Mainframe	317	4	329	341	368	394	421	455	7
- Minicomputer	119	5	125	128	132	135	138	142	3
- Workstation/PC	390	12	437	525	688	865	1,031	1,222	23
Systems Operations	875	11	970	1,115	1,329	1,521	1,712	1,935	15
- Platform Sys. Ops.	404	9	440	493	598	662	703	749	11
- Applications Sys. Ops.	471	13	530	622	731	859	1,009	1,186	17
Systems Integration	203	9	221	253	300	366	438	524	19
- Equipment	37	9	40	44	52	65	78	93	19
- Software Products	19	9	21	25	30	35	42	50	19
· Applications	15	9	16	19	23	27	32	38	19
· Systems	4	9	4	6	7	8	10	12	18
- Professional Services	143	9	156	179	212	260	310	371	19
- Other	4	9	4	5	6	6	8	10	19
Professional Services	1,486	5	1,560	1,643	1,837	1,980	2,093	2,245	8
- Consulting	352	7	377	415	480	536	587	655	12
- Software Development	930	4	967	990	1,076	1,129	1,163	1,203	4
- Education & Training	204	6	216	238	281	315	343	387	12
Network Services	221	7	236	256	298	337	366	397	11
- Electronic Info. Svcs.	166	7	178	192	228	260	282	306	11
- Network Applications	55	5	58	64	70	77	84	91	9

The reconciliation of the figures for the 1991 and 1996 markets is shown in Exhibit B-2.

EXHIBIT B-2

Insurance Sector
1992 MAP Data Base Reconciliation
($ Millions)

Delivery Modes	1991 Market				1996 Market				91-96 CAGR per data 91 Rpt (%)	91-96 CAGR per data 92 Rpt (%)
	1991 Report (Fcst) ($M)	1992 Report (Actual) ($M)	Variance from 1991 Report ($M)	Variance from 1991 Report (%)	1991 Report (Fcst) ($M)	1992 Report (Fcst) ($M)	Variance from 1991 Report ($M)	Variance from 1991 Report (%)		
Total Insurance Sector	4,410	4,275	-135	-3	7,750	7,055	-695	-9	12	11
Processing Services	375	363	-12	-3	530	482	-48	-9	7	6
Turnkey Systems	311	301	-10	-3	397	374	-23	-6	5	4
Applications Software Products	852	826	-26	-3	1,750	1,590	-160	-9	15	14
Systems Operations	902	875	-27	-3	1,885	1,712	-173	-9	16	14
Systems Integration	210	203	-7	-3	481	438	-43	-9	18	17
Professional Services	1,532	1,486	-46	-3	2,305	2,093	-212	-9	9	7
Network Services	228	221	-7	-3	402	366	-36	-9	12	11

1991 Market - The figures for the 1991 market have been uniformly reduced by 3% to reflect the continuing effects of the economic slow-down, ongoing commercial real estate problems that affect the investment base, and a general uncertainty as to the regulatory environment and new competition from financial institutions. Expenditures, by delivery mode, have maintained their proportionate relationship.

1996 Market - Even the most pessimistic forecaster agrees that by 1996 the recent recession will be only a memory, but the effects will still be felt in terms of a slightly reduced market size and long-term compounded annual growth rate (CAGR). INPUT estimates that:

- The expenditures for 1996 will be approximately 9% below the previous forecast, except for turnkey systems, which will only be 6% less. These changes are the result of the cumulative effect of lowering the 1991 base numbers, the anticipated recovery occurring in late 1992 or early 1993, and an elasticity in the recovery pattern typified by strong initial expenditures in 1994, tapering to a sustainable 10% growth in 1996.

- The CAGR for the entire sector for 1991-1996 will be 11% rather than the 12% noted in the prior report. This is the result of extending the inhibiting effects of the economic slowdown for one additional year. The delivery modes experiencing the strongest growth will be systems integration, systems operations and applications software. Growth for turnkey systems, processing services and professional services will be below the overall industry average. All reflect the impact of the industry's steady migration to a new processing environment using central data bases accessed by remote, networked terminals and systems. Re-designing, re-engineering and re-architecting the systems environment and insurance applications are all activities that favor the systems integration, systems operations and software development functions. Turnkey systems, other than at the agency level, will become less common, as will processing services, and professional services activities will be impacted by the more comprehensive involvement of systems integrators and the growing availability of third-party applications well suited to the new systems environment.

By any measure, the insurance sector of the information services marketplace is still healthy, and most forecast changes have been adjustments to the effects of continued economic slowdown rather than indications of any intrinsic industry weakness.

About INPUT

INPUT provides planning information, analysis, and recommendations for the information technology industries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions.

Subscription services, proprietary research/consulting, merger/acquisition assistance, and multiclient studies are provided to users and vendors of information systems and services. INPUT specializes in the software and services industry which includes software products, systems operations, processing services, network services, systems integration, professional services, turnkey systems, and customer services. Particular areas of expertise include CASE analysis, information systems planning, and outsourcing.

Many of INPUT's professional staff members have more than 20 years' experience in their areas of specialization. Most have held senior management positions in operations, marketing, or planning. This expertise enables INPUT to supply practical solutions to complex business problems.

Formed as a privately held corporation in 1974, INPUT has become a leading international research and consulting firm. Clients include more than 100 of the world's largest and most technically advanced companies.

INPUT OFFICES

North America

San Francisco
1280 Villa Street
Mountain View, CA 94041-1194
Tel. (415) 961-3300 Fax (415) 961-3966

New York
Atrium at Glenpointe
400 Frank W. Burr Blvd.
Teaneck, NJ 07666
Tel. (201) 801-0050 Fax (201) 801-0441

Washington, D.C.
INPUT, INC.
1953 Gallows Road, Suite 560
Vienna, VA 22182
Tel. (703) 847-6870 Fax (703) 847-6872

International

London
INPUT LTD.
Piccadilly House
33/37 Regent Street
London SW1Y 4NF, England
Tel. (071) 493-9335 Fax (071) 629-0179

Paris
INPUT SARL
24, avenue du Recteur Poincaré
75016 Paris, France
Tel. (1) 46 47 65 65 Fax (1) 46 47 69 50

Frankfurt
INPUT LTD.
Sudetenstrasse 9
W-6306 Langgöns-Niederkleen, Germany
Tel. 0 6447-7229 Fax 0 6447-7327

Tokyo
INPUT KK
Saida Building, 4-6
Kanda Sakuma-cho, Chiyoda-ku
Tokyo 101, Japan
Tel. (03) 3864-0531 Fax (03) 3864-4114

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