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_1995-2000_
HEALTH SERVICES
FORECAST UPDATE

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February 1996

Dear Colleague:

Enclosed is the 1995 forecast update for the health services market sector, one of fifteen such markets or industries tracked by INPUT as part of its U.S. Market Analysis Program (MAP).

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

Key factors affecting the health services sector include the changes in the health care industry, moving from a traditional "processing" environment to one emphasizing databases—databases that will be, in some cases, so large that INPUT uses the term "megabases" to describe them. This report examines these changes, notes their effect on the information services market, and provides a forecast of the health services industry's spending for information services through the year 2000.

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

You should file this report in your Market Analysis Program binder, behind the tab marked Health Services.

Sincerely,

Bob

Robert L. Goodwin
Vice President

Enclosure

Report Quality Evaluation

1. Report title:
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Thank you for your time and cooperation.

INPUT

Information Services Markets
1995-2000

Health Services

Forecast Update
February 1996

Table of Contents

List of Exhibits

I

Introduction

This chapter identifies the purpose and scope of this report, explains INPUT's research methodology and the techniques used in the preparation of the forecast data, notes the organization of the report and provides a general business overview of the U.S. economy.

A
Purpose

The purpose of this *Forecast Update* is to identify key changes in the market for information services in the health services industry, and to provide the 1995 INPUT forecast for this market sector.

B
Scope

For the purposes of this report, the U.S. health services industry (SIC 80) includes the segments noted in Exhibit I-1.

Exhibit I-1

Health Services Industry Segmentation

- Hospitals: SIC 806
- Physicians and other professionals: SICs 801, 803, 804, 808
- Other service environments, such as nursing homes, extended care, lab services and home health services: SICs 805, 807, 809

C
Methodology

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

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

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

D
Organization

Following this chapter's introduction of the purpose and scope of the report, an explanation of INPUT's methodology in preparing it, and a general overview of the U.S. economy, the remainder of the document is organized as follows:

Chapter II—Trends, Events and Issues—Offers a research-driven analysis of the sources and uses of technology in the health services industry, and identifies health care trends and their impact on the information technology industry. Considered is the changing health care IS environment, and the movement from a "processing" to a "database" IS model.

Chapter III—Information Services Market—Provides forecasts of the health services industry sector's spending on information services for seven product/service categories. This chapter also examines the major forces

affecting the information services market and identifies selected information services vendors serving the health services sector.

In addition, there is an appendix:

Appendix A presents INPUT's forecast database and reconciliation. The forecast database contains a yearly (1995-2000) forecast of user expenditures by product/service category for the health services industry sector. The forecast reconciliation compares this report's 1994 and 1999 numbers with those provided in INPUT's previous health services report, and explains the reasons for any significant differences.

E
General Business Overview

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

In general, most sectors of the U.S. economy did well in 1995—better than they did in 1994. Growth was about 6%, while inflation stayed in the 3% range. Consumer confidence returned and with it retail purchases and increased investment, and the securities market had one of its best years ever, with the Dow-Jones exceeding 5,000 for the first time. Inflation is expected to grow slightly through 1996 and 1997 to 3.3% and then decline to 3.0 % by the millennium. The federal budget continues to be a point of contention, especially in an election year, but expectations are for a conservative fiscal policy that should be good news for the debt and equity markets as well as for the dollar. U.S. goods are expected to continue to do well in overseas markets.

Cbout INPUT

U.S. Market Analysis Program

*Information Services Markets,
1995-2000*

Health Services

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II

Trends, Events and Issues

A

Health Care Trends

1. The Traditional "Processing" Model of Health Care is Changing

As noted in INPUT's 1994 report on the health services sector, over the last thirty years (i.e., since Medicare), the health care system has been driven by fee-for-service reimbursement maximization which, from a systems standpoint, has in turn been driven by claims processing.

To generate proof that the service has been rendered, enormous amounts of data are collected. This is then sent to an insurer for payment. A certain amount of the data is retained for cost analysis and rate setting, but most of the data is ignored or even discarded. Exhibit II-1 illustrates the traditional process.

A large industry has grown to support this process. It includes revenue maximization consultants to hospitals, administrative support software for hospitals, and outsourcers to support insurance processing functions such as workflow processing, computer-assisted decision making, customer service and support and payments and reporting.

The claims submission/reimbursement process consumes about $50-$60 billion annually (spread among health care providers, insurers and information services and software providers), with few improvements to health care or cost control.

Exhibit II-1

Health Services Traditional "Processing" Model
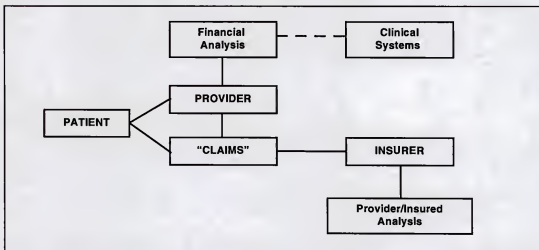
Source: INPUT

2. The Impact of Managed Care: The "Database" Model

Managed care greatly reduces (sometimes virtually eliminates) the transaction processing stream of the traditional model.

This is not to say that data processing needs diminish—they are changed. In what might be termed the "database" model, both providers of care and care managers/insurers will need access to large collections of data about patients, their treatment and underlying costs. Exhibit II-2 provides a schematic of the database model.

Exhibit II-2

Health Services Database Model
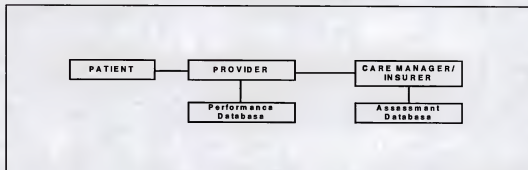
Source: INPUT

a. Needs of Providers

Health care providers will need to use large, customized databases to respond to the challenges of the managed care environment. Similar work may have gone on in the past, but never at the same level of intensity. It is no exaggeration to say that the well-being, often survival, of the provider will depend on the successful use of data. Following are examples of the kinds of data-based activities that will be routinely conducted by providers in a managed care environment.

Examples of Data Types

The types of data necessary to function in a managed care environment are illustrated by the following examples. INPUT expects the breadth and depth of data utilized to become increasingly complex as data becomes a key competitive tool.

- Characteristics of current patients, in terms of demographics, socioeconomic status, diagnosis and treatment profiles, etc.

- Costs and profitability by type of patient, diagnosis and treatment

- The effect on utilization and profitability of changing the patient mix by means of changes in services offered, marketing, physician recruitment, building or joining provider networks, managed care contract terms, and affiliations with managed care organizations

- Assessing the financial effects and impact on services of affiliations with other providers

- Classifying physicians from the standpoint of quality, cost and revenue generation

- A self-assessment of a provider in terms of: cost; outcomes; customer satisfaction; past, current and expected performance; individual services provided; patient mix; and national, regional and local norms.

- In-depth analysis to determine the reasons for a provider's variance from norms, and actions that can be taken to adjust or improve the provider's position

Examples of Data Uses

The data types described in the preceding section will be the foundation for negotiations not only with managed care organizations, but also with physician groups, other provider networks, traditional insurers and other reimbursers, as all reimbursement becomes competitive.

Managed care organizations (MCOs) already use data to obtain the best terms possible from providers. Providers must, in turn, learn to use data to strengthen their own positions.

Providers will use the data in other, related ways—for example, to:

- Identify services in which they have a competitive edge in terms of cost, quality, attractiveness, etc.

- Improve other services—and measure the effects of changes

- Experiment with the effects of different delivery mechanisms on revenue and customer satisfaction

- Identify the attributes of optimum delivery partners and identify candidates that come closest to the profile

- Develop one or more targeted marketing plans and track the effects

- Reduce costs and model the impact before and after implementation (by comparing themselves to other providers)

b. Needs of Managed Care Organizations

An MCO needs, essentially, supersets of the data that are required by individual providers. MCOs already collect and use large amounts of data. However, market conditions will require larger and more sophisticated analyses in the future.

- The cost to employers of traditional health insurance has until now provided a price umbrella for MCOs. As more competition develops between MCOs, "pricing pencils" will have to be sharpened.

- Similarly, some providers are now uncertain and ill-informed in their dealings with MCOs. It does not take a very astute MCO to negotiate a good deal (for itself) with providers. The Darwinian struggle now going on among providers will create fewer, smarter provider groups.

Examples of Data Types

Ultimately, there will be no health-related data that an MCO will not be able to use to improve its performance. High spots include:

- Demographics of the patients that it covers. (Highlighting any differences between the population that it covers—or a subset—and the characteristics of a population it might potentially cover.)

- Encounters and episodes

  - Variations and causes

  - Actual treatments versus best practice protocols

- Service utilization (again, compared to equivalent norms, both regional and national)

  - Overall utilization

  - Profiles of individual diagnoses/treatments compared to typical and best practices

- Individual and collective provider profiles

  - Cost and outcomes (segmented)

  - In-network versus out-of-network

  - Provider scorecards (public and private)

Data Use Examples

A successful MCO must develop the ability to assess and price risk correctly, using both traditional and innovative actuarial methods.

- The setting of prices (to employers) and payments (to providers) will become increasingly complex and sophisticated. Data, correctly mobilized, will be the main differentiator in these negotiations.

- The pre-negotiation "homework" will analyze potential new blocks of patients and profile and compare potential providers.

Tracking of providers already part of an MCO's network will be critical for balancing cost control against quality and customer satisfaction.

Currently, databases are of secondary importance in marketing directly to prospective patients (because employers generally give their employees a choice of MCOs. In the future, INPUT believes that database-driven marketing will become much more important; similar conceptually, although not operationally, to the use of databases in the direct marketing of other consumer-oriented products and services.

As the health care system rearranges itself, some large providers may capitate (charge a certain amount per member) other subproviders. These large providers will take on aspects of an MCO.

Indeed, data analysis vendors and network services providers may learn enough about managed care and risk management that they can even take on the insurance function.

c. Clinical Paths—Another Approach

In late 1995, many health care organizations were implementing clinical paths to assure quality of managed care. A nationwide *Clinical Path Survey*, conducted by Andersen Consulting, revealed that more than four-fifths of survey respondents used clinical paths. In addition, most who didn't plan to begin such an initiative in the near future.

Clinical Path - The definition of a clinical path is a coordinated, standard plan of treatment relating to a specific illness or condition. The numerous steps within a path vary depending on the diagnosis, but all paths are designed to promote collaboration among providers. From the surgeon performing the bypass operation, to the pharmacist dispensing the nitroglycerin tablets, to the home care aide who assists in changing the dressings on the wound—each is part of a clinical path designed to ensure quality, manage costs and measure patient outcomes.

The survey suggests that clinical paths are viewed as a critical component of cost reduction and quality improvement efforts. Roughly three-quarters of the survey respondents cite increased quality and effectiveness of care as top reasons for developing clinical pathways. Other reasons include cost effectiveness, shorter hospital stays, and improved multidisciplinary teamwork and communication.

For the future, several innovative MCOs are beginning to extend the concepts of clinical paths beyond treating illness to managing health and wellness by developing health paths or life care paths. These provide a basis for plan members to collaborate with physicians, nurses, health educators and others to focus on wellness, prevention and proactive management of chronic diseases.

3. The "Megabase" Environment

The data needs of participants in managed care will, in INPUT's view, be extremely large. To highlight this fact, in early 1995 INPUT created the term "health care megabases" to describe these stores of data (see Exhibit II-3).

Exhibit II-3

Health Care Megabases©

• Hospitals
• Physician groups
• Health networks

• Managed care
• Insurers
• Pharmeceutical manufacturers
• Governments

Demographics
Costs:
Inputs/Intermediate
Costs:
Treatments/Outcomes

Health status
Encounters
Procedures
Providers
Patients

Outputs
Actuarial analysis
Public health studies
Outcome analysis
Provider scorecards
Cost norms
Treatment protocols

Uses
Drug studies
Marketing scenarios
Patient-mix models
Provider negotiations
Partnering
Mergers and acquisitions
Network modeling
Pricing modeling
Coverage alternatives

Source: INPUT

The "megabase" is much more than just a database or technical environment. The following components will be needed to make the megabase work:

- A thorough understanding of how an organization's business objectives (as well as more tactical activities) relate to data

- Specific content knowledge in such areas as:

  - Cost components
  - Medical practice
  - Demographics
  - Health marketing

- Identification of the specific data elements, their source and data structures

- The DBMS and related access methods

- Analytic tools, including:

  - Data retrieval and analysis packages
  - Actuarial methods
  - Executive information systems

Megabases will be made up of a combination of off-the-shelf and customized components. The proportions will be determined by the level of need and resources available.

B

Budgets and Health Care Information Technology

General patterns for information systems budgets in the health care industry are shown in Exhibit II-4.

Increasing Centralization - There is a trend toward more centralized control of information systems budgets and spending, especially among hospitals (where decentralized turnkey information systems purchases were the pattern in the past). This is driven both by the necessity to manage information more carefully to meet managed care accountability requirements and by strategic thrusts toward systems integration—especially of departmentally purchased systems—in a drive to improve service throughout the hospital.

Exhibit II-4

Health Care Information Systems Budgets

- Budget becoming more centralized
- Budgets range from 0.5% to 3% of revenues
- Hospital survey shows information systems budgets now growing after being "flat" in 1993-1994

Source: INPUT

Budget Range - Health care industry information systems budgets (including hardware, salaries and all other products and services) range widely—from 0.5% to 3% of revenues—based both on the segment of the health care industry and the specific situation of each institution. Nursing homes and similar residence institutions, for example, generally have the least complex and least costly IS requirements; these are estimated to average just 1.0 % of the budget. Clinics and other groups of professionals—and, to a lesser extent, individual physicians' offices—are spending relatively more, both for computerization (or for upgrades from turnkey minicomputer

systems to networked client/server systems) and to integrate with one or more local hospital systems. Their average IS spending is estimated at 2% of revenues.

Hospitals' needs are the most complex, but even their information systems spending varies widely, depending on budget constraints, the state of their systems, and significant variables such as transitions from processing services to in-house operations or from mainframe (or minicomputer) processing to a networked system. Observers of hospital systems generally agree, however, that 2% to 3% is at the high end of what most hospitals spend on information systems.

Hospital IT Budget Trends - A recent survey of hospital IS department personnel and discussions with a number of health care information services vendors indicate that after a period in 1993-1994 when hospital IS spending flattened or declined in anticipation of legislated health care reform, a resurgence in health care IS spending occurred in 1995. Sources attribute the rebound to a general belief in the health care provider community that the trend to managed care is inevitable, regardless of any legislative mandates. The belief is driven by both employer and general social pressures for cost control—which equates to managed care.

Hospital Applications Plans - As hospitals assess their current needs and look to the future, trends in applications development emerge as the needs of the industry benefit from technology availability. The "megabases" discussed earlier as a solution to the information needs of not just the hospitals and service providers, but the industry as a whole, also define an environment in which database-related applications development is taking place. Exhibit II-5 gives a sampling of the major applications development efforts being addressed by hospitals over the next few years.

Exhibit II-5

Hospital Application Development Trends

- Database integration
- Moving to a client/server environment
- Electronic patient records
- Data warehousing for decision support
- Expanded EDI usage

Source: INPUT

Databases, in terms of record storage and access and integration with existing systems and applications, are a key application development area, followed closely by the use of client/server architecture for hospital

information and application needs. Patient care and bedside systems are also important, especially where they can minimize staffing costs and improve patient handling and record keeping, and the use of EDI for claims processing is expected to grow over the balance of this decade.

C

Electronic Medical Records (EMRs)

Electronic medical records (EMRs) are an important health care trend because they improve medical care and customer service, reducing the costs to a health care plan's sponsor. EMRs create easier access to medical records and reduce the chance of lost or misplaced information, such as expensive test results. EMRs also transmit full blocks of information, instead of isolated bits. This transfer technique allows a patient's entire record to flow from a primary physician to a recommended specialist without patients having to recount their medical history.

Data is arranged so that the doctor can see all relevant information at once. EMRs also improve outcomes research, which involves the identification of effective procedures for a specific patient group. More sophisticated EMRs can be hooked to libraries, allowing a physician to access information as the patient waits. EMRs can flag certain patients' records with warning signs, allowing the doctor to recommend preventive care.

Major ways in which the electronic patient record will reduce health care costs include challenging the redundancies in paperwork administration; providing evidence of unnecessary or inefficient treatment; and providing for on-line patient care diagnostics based on standard treatment protocols.

D

Impact of the Internet

A major use of the Internet in health care services today is for transmission of orders for drugs and medical supplies and E-mail to support these areas. Although the bulk of this work is still transmitted via VANs, proprietary networks and EDI networks, much of this traffic will be shifted to the Internet over the next five years.

A second major use of the Internet will be for acquisition and authorization of claims data.

The Internet ultimately will be used to obtain remote access to medical records. However, privacy issues will dictate tough security requirements. In addition, more bandwidth will be required to transmit scans and other complex graphics.

III

Information Services Market

A
Major Forces Affecting the Information Services Market

1. Driving Forces

The most significant long-term trend continues to be the need for very large databases in a managed care environment (megabases). Other ongoing impacts of managed care include:

Need for Semi-Customized Systems - There will be an increasing need, in the short and medium terms, for semi-customized systems. Up to now, packaged solutions have predominated, but a number of current and future applications will need customization in managed care settings:

- *Networks* - Provider networks will require bridges—for data, applications and communications networks.

- *Megabases* - Megabases will need two-way links with provider applications and databases.

Long term, these needs will result in a new generation of applications software products; until that point, there will be increases in the level of systems integration services.

Importance of Cost Accounting - Until recently, health care providers (especially hospitals) viewed cost accounting primarily as a means of using the reimbursement system to maximize fee-for-service revenues. In the evolving contract-for-services environment, cost accounting will become a tool for stripping out nonessential expenses and supporting higher levels of service. This reorientation will require new sets of financially oriented

applications (including core patient care modules) and clinical patterns that define standard treatments for specific medical problems.

Information Integration - The need for integration of information used by providers will be necessary on two levels. First, there is the need for improving or setting up "customer information systems" along the lines used in other industries for ongoing customer contact. Essentially, this would consist of all information about patients, patient families and covered groups served by a provider or group of associated providers. This "CIS" approach overlaps, and is a driver of, megabases. Second, providers that have common business/health care relationships will have to be linked, both at the CIS level and to support ongoing operations. These initiatives will have to show that they pay for themselves; much technology up to now (e.g., electronic medical records, EDI, even client/server implementations) has been an end in itself, regardless of the tangible benefits that are produced.

Exhibit III-1 summarizes the driving forces noted above.

Exhibit III-1

Driving Forces—Health Care Information Services Market

- Managed care's need for very large databases (megabases)
- Need for semi-customized systems in a managed care environment
- The changed focus of cost accounting: from maximizing fee-for-service
- reimbursement to cost accounting for minimizing costs
- Integration of provider information

Source: INPUT

2. Inhibiting Forces

There are trends within the health care industry that will inhibit certain aspects of information services growth. The most significant are:

Decline in Fee-For-Service Reimbursement - There is a decline in the relative (and, soon, absolute) importance of fee-for-service reimbursement. This will affect providers whose offerings directly or indirectly are built on supporting or maximizing reimbursement. Many of the established applications software and turnkey offerings are in this category. Interestingly enough, one of the newest offerings—EDI services—has been touted mainly as helping traditional reimbursement.

Increasing Mergers Among Care Providers - Managed care is accelerating mergers among care providers. In the short run, the impact will be obvious: fewer buyers of information services. In the longer run, the fewer, larger

buyers may create a larger number of more self-sufficient provider organizations that will need fewer outside products and services. These larger organizations will often serve as a common buying point for goods and services of all kinds. This will increase the number of large deals possible. In ten years, the number of "hospital buying points" may shrink from 4,000-5,000 to the hundreds. This will create a double-or-nothing situation for many vendors.

Diminishing Number of Physicians - Not only will there be fewer physician groups under managed care, there will also be fewer physicians overall: Patients may receive about as many minutes per year of doctor time, but this time will be arranged more efficiently, reducing the need for physicians overall. In addition, managed care aims to greatly reduce the number of specialists and specialist procedures: Specialists historically have been disproportionately high users of information services.

Exhibit III-2 summarizes these inhibitors.

Exhibit III-2

Inhibiting Forces—Health Care Information Services Market

- Decline of fee-for-service reimbursement
- Mergers among health care providers
- Smaller number of physicians

Source: INPUT

3. Analysis

In INPUT's opinion, the driving forces are more powerful than the inhibitors. This due to the fact that the inhibitors will have largely short-term, transitional effects, and some of the inhibiting factors (such as mergers) will act as accelerators in other areas (such as megabases).

However, there will be so many different forces at work for the remainder of the 1990s that caution is required in planning. For instance, the timing of individual factors can have a significant impact on the market in a particular timeframe. In addition, IS in general, and software in particular, are highly dependent on the larger events in the health care sector. However, significant government actions affecting health care (e.g., Clinton's reform plan) are almost certainly on "hold" for the next few years. But the vagaries of politics, especially in an election year, are such that no long-term plan should assume a free hand indefinitely among managed care organizations.

B
Information Services Market Forecast

The overall health services market forecast is summarized in Exhibit III-3.

Exhibit III-3

Information Services Market, 1995-2000

Numbers are rounded.
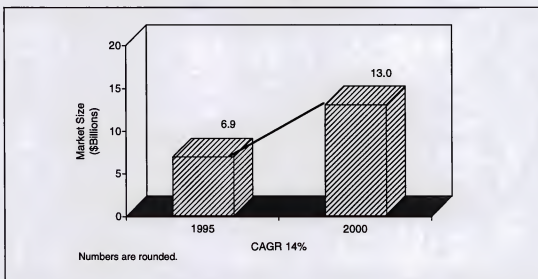
Growth from 1994 to 1995 was 11%, going from just under $6.2 billion to almost $6.9 billion. This was a percentage point lower than the growth from 1993 to 1994 (12%) and reflects to some degree the decision delays resulting from uncertainties about federal health care reforms, and some minimal effects from consolidations and other inhibiting forces discussed earlier.

Long term, however, the compound annual growth rate (CAGR) through 2000 is at a strong 14%, up from last year's five-year projection for 1994 to 1999 of 13%. This slight increase reflects the increasing importance of megabases and the growing trends toward outsourcing, the largest product/service category (by dollar amount) in 2000, and the second most rapidly growing, at a 17% CAGR.

C
Product/Service Category Forecasts

Exhibit III-4 segments the 1995-2000 forecast into the seven product/service categories tracked by INPUT. Each is discussed below:

Professional Services - As the need to improve the information infrastructure—e.g., cost accounting, megabases and networks—drives the health services market sector, there will be increased need for both IS-related consulting and software development and support. INPUT believes that the IS consulting growth seen from 1994 to 1995 will continue through the millennium, at a steady 17% growth rate. Software development spending has increased dramatically from prior estimates—primarily as a result of the increase in system/applications customization and database support and development—and is expected to continue to grow at a slightly lower rate (14% CAGR) through the year 2000. The result of these forces is a professional services market of more than $700 million in the year 2000, or almost twice the size of the 1995 market.

Systems Integration - Systems integration will be the fastest growing information services market in the health services industry, increasing at a 19% CAGR from almost $450 million in 1995 to almost $1.1 billion in 2000. Driven by consolidations and the integration of new applications, new systems, and large, complex databases, all areas of this product/service category will experience good growth, with systems integration-related professional services and software products the strongest at 22% and 21% CAGRs, respectively, for the five-year period. Activities will include constructing megabases and tying them into existing applications. Equipment expenditures are the lowest growth area (at a respectable 14%) and reflect the impacts of both decreasing hardware costs and the inevitable equipment redundancies that result from consolidations.

Exhibit III-4

Information Services Market by Product/Service Category, 1995-2000

CAGR

Category	2000	1995	CAGR
Outsourcing	3,850	1,800	17%
Applications Software	3,100	1,550	15%
Network Services	1,900	920	15%
Turnkey Systems	1,650	1,250	6%
Systems Integration	1,050	440	19%
Processing Services	700	600	3%
Professional Services	700	350	15%

Market Size ($ Millions)

Numbers are rounded.
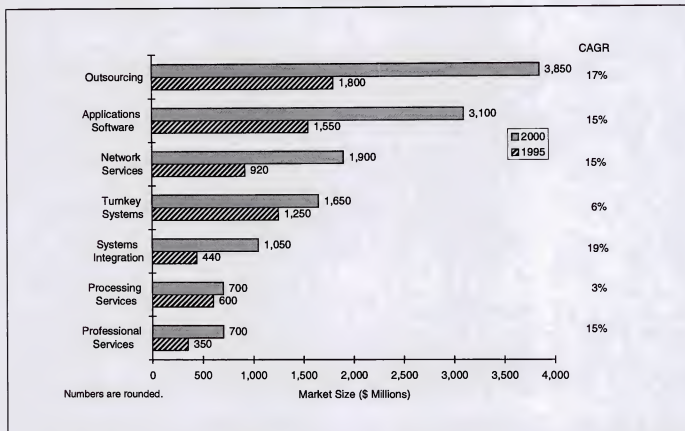
Outsourcing - Outsourcing, the second fastest growing product/service category, will increase at a 17% CAGR from 1995 through 2000, growing from $1.8 billion in user expenditures to more than $3.8 billion by the millennium. Business operations will be the fastest growing sub category, followed by network management, applications management, network services and desktop services—all growing at a 1995-2000 CAGR of 20% or better. Growth for applications operations, the largest spending category, will be steady at 12%, while platform operations growth (the traditional hardware-only category) will be at a conservative 5%, reflecting the decreased importance of a hardware-only outsourcing relationship.

Processing Services - The growth rate of processing services continues to decline in this industry sector, as it has in almost all other U.S. market sectors, reflecting the decreasing value of pay-as-you-go service offerings and, in the health services industry, the negative impact of the decline of fee-for-service reimbursements. At almost $600 million in 1995, the processing services market will grow at a 3% CAGR to $700 million by the year 2000.

                                      MVH5

Network Services - As in all areas of American industry, expenditures on network services are increasing at a strong pace, and the health services sector is no exception. Overall growth is at a 15% CAGR, from more than $900 million in 1995 to almost $1.9 billion in 2000. The strongest growth will occur in the network applications area, as telecommunications resources are tailored to the specific needs of individual medical communities or provider groupings. As public or semi-public megabases become more common, network services will benefit from access needs via electronic information services (EIS); that portion of this forecast is expected to grow at a 13% CAGR through 2000. Internet use will increase over the next five years as greater bandwidth becomes available (for scans, X-rays, etc.) and the mandatory privacy issues (for medical records, prescriptions and other sensitive items) are resolved.

Applications Software Products - This product/service category will grow at a strong 15% from 1995 to 2000, from more than $1.5 billion in spending to $3.1 billion by the millennium. Mainframe and minicomputer growth will be conservative, at 4% and 7%, respectively; some of that growth will come from the redesignation of platforms to institutional or departmental server status. Strongest growth (23% CAGR) will occur with applications software products for the ubiquitous workstation/PC platforms that are performing more and more standalone functions and also are the clients in what is increasingly becoming a client/server world. Software products for use with megabases will include analytical tools and traditional software with scalable or modifiable options tailored for use with large databases.

Turnkey Systems - The turnkey segment of information services will grow at a modest 6%, driven primarily by a continuing but slowly decreasing interest in departmental or application-specific standalone systems that traditionally have run on minicomputers using standard operating systems such as DOS, UNIX or Windows. With the advent of megabases, turnkey systems will have an opportunity to function as dedicated megabase analysis engines drawing on the greater processing power of the minicomputer (or "departmental server," as it is now becoming known). Without new applications areas, such as megabase analysis, expenditures on turnkey systems would decrease even more rapidly, as users shift applications away from minis and to standard, low-cost PC platforms. Total expenditures for turnkey systems will be better than $1.2 billion in 1995, growing to almost $1.7 billion by 2000.

D
Competitive Environment

Exhibit III-5 lists, in alphabetical order, major representative vendors to the health services industry. Besides the name of the company (and division, where appropriate), the exhibit also identifies the city and state in which the headquarters of the company or health services business unit is located, the estimated revenues from health services industry-related products and services, and a notation of the most significant types of information services products or services that are offered. Note that many of the vendors regard themselves as providing support systems for various (or all) types of health services activities, and for this table, INPUT has selected product/service offering categories deemed most significant.

To curtail chart entries in Exhibit III-7, the following abbreviations are used for the indicated information services product/service categories: SI is systems integration; AS is applications software; ProcSvc is processing services; PS is professional services; Outsrc is outsourcing (previously called Systems Operations); NS is network services; and Tky is turnkey systems. If financial data is not available, an N/A has been entered in the "Revenue" column.

Exhibit III-5

Information Services Vendors to the Health Services Industry

Company Name	Headquarters	1995 Estimated U.S. Health Services Industry Revenues ($M)	Significant Product/Service Offerings
Andersen Consulting	Chicago, IL	120	AS, PS, SI
Cerner Corporation	Kansas City, MO	120	AS, Tky
Citation Computer Systems, Inc.	Chesterfield, MO	20	AS, PS
CSC Healthcare Systems	Farmington Hills, MI	35	SW, SI, Outsrc
CyCare Systems, Inc.	Scottsdale, AZ	70	AS, SI, NS
Electronic Data Systems (EDS)	Plano, TX	N/A	Outsrc, SI
First Data Corporation (includes FFMC)	Hackensack, NJ	500	ProcSvc, Outsrc,Tky
EquiFax, Inc.	Atlanta, GA	150	AS, ProcSvc, NS
HBO & Company	Atlanta, GA	237	AS, Tky, PS, Outsrc
Healthcare Compare	Chicago, IL	250	AS, ProcSvc, NS
Hewlett-Packard (Healthcare Info. Mgmt. Grp.)	Andover, MA	N/A	AS, PS, SI
IBM (Health Industry, Advantis Units)	Atlanta, GA	N/A	PS, SI
IDX	Burlington, VT	100	AS
Management Systems Associates	Raleigh, NC	N/A	AS, SI, PS
Medical Systems Corporation	Evanston, IL	35	AS, SI, Outsrc
Medaphis Corporation	Atlanta, GA	120	AS, ProcSvc, NS
MEDITECH	Westwood, MA	105	AS, Tky
Medistat	Ann Arbor, MI	90	AS, ProcSvc, NS
Reynolds and Reynolds - National Medical Computer (NMC) Service	San Diego, CA	N/A	AS, Tky
Sachs Group	Evanston, IL	N/A	AS (databases)
Shared Medical Systems Corporation (SMS)	Malvern, PA	439	ProcSvc, Outsrc, NS
3M	Salt Lake City, UT	65	AS
Unisys	Blue Bell, PA	N/A	AS, PS, SI

Source: INPUT

(BLANK)

A

Forecast Database and Reconciliation

A
Forecast Database

The full information services forecast database for the health services industry sector is contained in Exhibit A-1. The values contained in the database are in millions of dollars. The values for various totals may vary slightly from amounts used in other charts, graphs and exhibits in this document, because larger amounts in the exhibits are normally rounded for ease of presentation.

B
Database Reconciliation

Exhibit A-2 presents the reconciliation of INPUT's 1995 information services forecast for the health services industry with the 1994 forecast, for the years 1994 and 1999.

1994 - There were two significant variations between the 1994 and 1995 market sizings of the 1994 health services market for information services. The first was a 12% overstatement of the 1994 professional services market, which was the result of health care providers delaying purchasing decisions while they waited for a final resolution of the initiatives proposed by the Clinton administration. The second was a 12% underestimation of the outsourcing market that was corrected in 1995 after a review of outsourcing contract rewards.

1999 - The only major variance in the 1999 forecast is the 21% increase in the outsourcing market size for that year shown in this 1995 report, a result of both a higher adjusted base from 1994 and a 1% increase in the five-year CAGR as health care providers seek to concentrate on core competencies in an increasingly complex and competitive environment.

CAGR - The compound annual growth rate (CAGR) for the health services industry for the period measured, 1994 to 1999, held steady at 13%. The professional services growth rate has increased from 10% to 15% as expenditures for both software development and IS consulting grow at a more rapid pace, driven by the increased support requirements of a managed care environment and the growing trend toward using external high-cost, skilled resources to minimize burdened internal costs.

Exhibit A-1

HEALTH SERVICES
Market Size by Product/Service Categories, 1994-2000
($ Millions)

PRODUCT/SERVICE CATEGORIES	1994 ($)	Growth 94-95 (%)	1995 ($)	1996 ($)	1997 ($)	1998 ($)	1999 ($)	2000 ($)	CAGR 95-00 (%)
INDUSTRY TOTAL	6167	11%	6873	7710	8715	9920	11340	12975	14%
Professional Services	307	15%	352	403	466	539	620	703	15%
- IS Consulting	93	17%	109	127	150	177	208	241	17%
- Education & Training	51	10%	56	62	70	77	87	95	11%
- Software Development	163	15%	187	214	246	285	325	367	14%
Systems Integration	369	20%	441	522	623	745	889	1067	19%
- Equipment	120	16%	139	159	181	206	234	264	14%
- Software Products	37	24%	46	56	68	83	99	119	21%
- Professional Services	210	20%	253	304	370	451	550	677	22%
- Other	2	50%	3	3	4	5	6	7	18%
Outsourcing	1586	12%	1781	2028	2349	2764	3245	3839	17%
- Platform Operations	550	5%	575	613	662	719	748	778	6%
- Applications Operations	525	10%	578	641	718	811	917	1036	12%
- Desktop Services	190	18%	225	265	318	385	467	566	20%
- Network Management	187	25%	234	292	373	484	630	818	28%
- Application Management	69	20%	83	102	125	154	191	237	23%
- Business Operations	65	32%	86	115	153	211	292	404	36%
Processing Services	575	4%	596	617	638	660	683	700	3%
- Transaction Processing	575	4%	596	617	638	660	683	700	3%
Network Services	791	16%	915	1050	1215	1400	1640	1880	15%
- Electronic Information Svcs	425	12%	475	530	595	670	760	860	13%
- Network Applications	366	20%	440	520	620	730	880	1020	18%
Applications Software	1385	12%	1555	1765	2007	2305	2678	3121	15%
- Mainframe	430	5%	450	472	495	520	540	560	4%
- Minicomputer	355	7%	380	405	430	455	488	521	7%
- Workstation/PC	600	21%	725	888	1082	1330	1650	2040	23%
Turnkey Systems	1154	7%	1233	1325	1417	1507	1585	1665	6%
- Equipment	510	4%	528	550	567	582	600	620	3%
- Software Products	440	8%	475	525	580	635	675	715	9%
- Professional Services	204	13%	230	250	270	290	310	330	7%

Source: INPUT

Exhibit A-2

HEALTH SERVICES

1995 MAP Database Reconciliation
($ Millions)

| PRODUCT/SERVICES CATEGORIES | 1994 Market | | | | 1999 Market | | | | 94-99 | 94-99 |
	1994 Market (Forecast) ($M)	1995 Report (Actual) ($M)	Variance From 1994 Forecast ($M)	Variance From 1994 Forecast (%)	1994 Market (Forecast) ($M)	1995 Report (Forecast) ($M)	Variance From 1994 Forecast ($M)	Variance From 1994 Forecast (%)	CAGR per data '94 Rpt (%)	CAGR per data '95 Rpt (%)
Total	6044	6167	123	2%	10984	11340	356	3%	13%	13%
Professional Services	350	307	-43	-12%	572	620	48	8%	10%	15%
Systems Integration	366	369	3	1%	866	889	23	3%	19%	19%
Outsourcing	1416	1586	170	12%	2681	3245	564	21%	14%	15%
Processing Services	582	575	-7	-1%	706	683	-23	-3%	4%	4%
Network Services	795	791	-4	-1%	1712	1640	-72	-4%	17%	16%
Applications Software	1385	1385	0	0%	2887	2678	-209	-7%	16%	14%
Turnkey Systems	1150	1154	4	0%	1560	1585	25	2%	6%	7%

Source: INPUT