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April 16, 1993

Dear Colleague:

Please find enclosed your copy of INPUT's 1992 U.S. Information Services Market Analysis Program forecast update for the *Education Market, 1992-1997.* It provides a current assessment of the events and issues driving the education marketplace and offers INPUT's forecast of the market size for such services.

This report should be filed in Volume III of INPUT's *U.S. Information Servies Market Analysis Program* binders, behind the tab marked *Education.* The three MAPs binders, together with the hardbound delivery mode reports, provide a total assessment of the United States market for information services.

Also enclosed with this shipment is the forecast data base summary which covers all delivery modes and market segment reports within the MAP program.

If you have any questions regarding this report or any aspect of INPUT's services, please do not hesitate to contact me.

Yours sincerely,

Bob Goodwin

Robert L. Goodwin
Manager,
Information Services Market Analysis Program

Enclosure

VERTICAL MARKET ANALYSIS

EDUCATION

1993-1998

U.S. Information Services
Market Analysis Program

APRIL 1993

EDUCATION

INFORMATION SERVICES OPPORTUNITIES & TRENDS

1993-1998 FORECAST UPDATE

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Education

Information Services Opportunities & Trends 1993-1998 Forecast Update

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I

Introduction

A
Purpose

The purpose of this forecast report is to identify key changes in the market for information services in the education sector, and to provide the 1993 INPUT forecast for this market sector.

Sector Definition - The education information services market includes SIC codes 821, 822 and 823 and is divided into three principal applications subsegments:

- Administrative applications
- Academic research/courseware applications
- Library applications

Administrative applications include education-specific administrative applications and networking of intracampus and intercampus IS resources.

Academic research/courseware applications contain software for curriculum instruction and computer literacy at all academic levels, including vocational/technical schools. It also includes teacher, professor or department-specific research projects.

Library applications comprise catalog maintenance and information retrieval, circulation control, loans and reservations, acquisitions, periodical control, indexing, and text search and retrieval. Also added are on-line library computer services, incorporating search and cataloging services.

B
Organization

The balance of this report is organized as follows:

- Chapter II, "Trends, Events and Issues," discusses the effects of educational reform, technology, reduced budgets at all institutional levels. This chapter also looks at other issues, activities and changes that can have an impact on the current and future use of information services in the education marketplace.

- Chapter III, "Information Services Market Forecast," presents an analysis of the expenditures for information services, by delivery mode and submode, for the U.S. education market sector.

- Appendix A, which contains the "Forecast Data Base," presents a detailed forecast of user expenditures, by information services delivery mode and submode, for the education vertical market. A reconciliation to the previous forecast is also provided.

C
Methodology

Ongoing Research - Much of the data upon which this report is based has been gathered during 1992 and early 1993 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 in the education marketplace and the IS vendors serving that market. INPUT maintains ongoing relationships with, and a data base of, all interviewed users and vendors. Interviewees for the research portion of this report were selected from this data base of contacts.

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

Forecast Estimates - Vendors, when responding to interviewers 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 delivery modes from those used by INPUT. Thus, INPUT must

estimate revenue for these categories on a best-effort basis. For this reason, 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.

D
Related Reports

In addition to this market-specific report, the reader may also be interested in other INPUT-related reports, which address specific delivery mode markets and the U.S. and Worldwide markets for information services. Such reports would include the following INPUT publications:

- *U.S. Processing Services Market, 1992-1997*
- *U.S. Professional Services Market, 1992-1997*
- *U.S. Network Services Market, 1992-1997*
- *U.S. Applications Software/Turnkey Systems Market, 1992-1997*
- *U.S. Systems Integration and Outsourcing Markets, 1992-1997*
- *Electronic Commerce in the Media Industry, 1992*

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II

Trends, Events and Issues

A
Background

Unlike other market sectors upon which INPUT reports, the education market is not so much an industry as it is an institution. A high school education is regarded by most Americans as a fundamental right and the minimum level of academic training necessary to function as an adult in our society. Most adults (and businesses) consider a college education necessary for entry to higher-paying jobs in all industries. Almost all professions require an advanced (postgraduate) degree before an individual can be certified to practice a specific professional calling.

From Abe Lincoln trudging miles in the snow to obtain a grade-school diploma, to Rhodes scholars pursuing off-shore studies to broaden their perspectives, educational training is not only a fundamental right in these United States, it is the law.

Education is a topic upon that every teacher, student politician, parent, cleric and businessman has an opinion. The reason for the interest is obvious—the products of our educational system are the most valuable resource that America has in the highly competitive world economy. Our educational system produces our scientists, businessmen, healers, statesmen, and teachers. Our trade schools produce our craftsmen and skilled labor-force. Many clerics are concerned with the religious content, if any, of our curricula. Ethnic groups want equal access to education and equal opportunity after attaining a degree. Those with various handicaps hope to achieve their individual potential, provided that specialized educational resources are made available.

It is no wonder that this market sector draws so much interest. It is also no surprise that there are a number of trends, events and issues influencing this market in 1993 and beyond. The balance of chapter II discusses and analyzes these market influences.

B
Overview

In contrast to most other industry sectors about which INPUT prepares information services market forecasts, the education market is relatively stable. There is a predictable flow of students (customers for its *product*); most financials, both sources and expenditures of funds, are open to public view; and its environment and activities tend to be highly structured and slow to change. Accordingly, the overall assessment of this marketplace contained in the last full INPUT report on the education sector, published in January, 1992, is still valid. Significant changes that affect the information services market are noted in this forecast update and discussed in this and the following chapter.

C
Trends and Events

1. Education Industry Growth

At the end of 1991, according to the U.S. Department of Education, approximately 61 million persons were enrolled in American schools and colleges. Public and private elementary and secondary (K-12) schools held about 47 million students, while higher education (colleges and universities) enrolled approximately 14 million. Of the 47 million K-12 students, 30.4 million were elementary students enrolled in public schools. Projections from the National Center for Education Statistics (NCES) estimate that public elementary school enrollment will reach 31.8 million in 1995, and 33 million in 2000. In terms of growth, the year 2000 population represents a 9% increase from that of fall 1991. The growing numbers of younger pupils that are starting to again fill the classrooms will cause increases at the secondary school level—with record levels of enrollment anticipated by the end of the decade.

College enrollment in the fall of 1991 was estimated at 14.2 million—reflecting an increase from the record attendance in 1990. Enrollment is expected to increase slightly in the early-to-mid 90's, with traditional college-age students being augmented by part-time, and older women students.

Expenditures for all public and private education, from primary through graduate school, were estimated by the U.S. Department of Education to be $402 billion for the 1990-1991 school year, and $425 billion for the 1991-1992 year. This represents an increase of a modest 5.7%.

2. External Trends and Events

The primary external trends affecting education programs and expenditures continue to be:

- Budget restraints resulting from decreased tax revenue due to the lingering effects of the recent economic slowdown
- Diversity in the student population, causing many and varying educational requirements
- A wide variance in school facilities, based upon the level of local district or county support
- Curriculum reform

a. Budgets

Budgets for educational institutions at all levels continue to be a major concern. For public primary and secondary schools, and state colleges and universities, taxes are the primary source of funds. Unemployment, however, has eroded the tax base for many communities. Tax reforms, such as California's Proposition 13, are being considered by some states as a component of broader programs to reduce deficits and bring state spending under control. The federal budget, a key issue in the recent presidential campaign, and a major concern of the Clinton administration, is undergoing rigorous scrutiny, with the intent of reducing existing deficits and future spending.

The United States appears to have weathered the recent economic slowdown, and is now experiencing a slow, but steady, return to a growth economy. Growth, however, is expected to be a moderate 3% per year, over the next few years, and unemployment levels are forecast to remain at higher than normal levels for some time to come.

The relevance of these economic realities is that tax revenue (from all sources) to fund public schools and colleges will be constrained—probably to levels that will meet basic educational requirements, but will leave limited funding for curriculum enrichment or significant new educational resources. Balancing this to some small degree, however, is the growing trend of the business community to provide resources to schools and colleges through grants, donations or cooperative programs. Gifts and donations from parents, parent support groups, alumnae and philanthropic groups also increase educational budgets—especially at the university level.

America 2000 is a major federal program that has stated to increase the worldwide competitiveness of the American labor force (by the year 2000) through the improvement of the American school system. A key component of the America 2000 program is the New American Schools Corporation (NASDC), a non-profit short-term foundation charged with creating a nationwide systemic change in American education by funding innovative community educational reforms. As of January, 1993, 668 proposals from communities requesting grants were received by NASDC. To date, 11 have received tentative approval. The slow pace of the America 2000 program is disappointing to many who hoped that it would rapidly infuse new thoughts and new money into the American educational system.

Regardless of tax or economic constraints, educational institution budgets will grow at a modest 5% to 6% over the next few years and reserves will be available to fund necessary programs.

b. Diversity

Diversity takes many forms in the educational environment. It includes those with different learning capabilities, different language skills, differing economic backgrounds, different ethnic origins, and an increasing number of physically handicapped individuals who can be a part of the educational process. Virtually all educational systems now recognize diversity as a normal component of the educational process, and most teachers are skilled in dealing with it in the classroom.

Fortunately, one of the most effective tools to use with a heterogeneous class mix is the computer. In-class PCs, running sophisticated curriculum software, allow a teacher to more easily tailor instruction to individual student needs. In addition, the student has a powerful tool that, once mastered, is useful at all levels of education. CD ROMs allow students to view the same material, but hear narrative in two or more languages. Multimedia offers a mixture of sound, video and text in an interactive mode, which stimulates and teaches the student.

Diversity is a challenge, but it no longer has to be a major stumbling block for the educational system. Yet, as with most technical solutions, implementation can be costly, and levels of implementation will always be subject to budget constraints.

c. Variations in School Facilities

It is a fact, at all levels of American education, that there is great variation in the school facilities available in many districts, depending upon the level of district, county or state support. To some extent, this is also true of colleges and universities. Most schools have adequate heating, light and ventilation. But, ironically, electrical outlets in the classroom and telephone lines capable of supporting client/server or LAN activities for

shared resources are typically in short supply. This means that before many schools can take advantage of most forms of computer-assisted instruction, they must first bring electrical current to the classroom in sufficient quantity (and location) to support student use.

An alternative step to bring the computer to the student is to bring the student to the computer. This is the approach used by many schools which establish a learn*ing center* or *computer laboratory*, centralizing training in a single classroom using multiple PCs or terminals. Many teachers favor this approach because it is less disruptive of traditional teaching techniques, and tends to concentrate computer resources where they are most efficiently used. Courseware, especially that delivered in a client/server environment, is regarded by many instructors as most efficiently delivered in the learning center environment. In fact, courseware specifically designed for this environment is termed an Integrated Learning System (ILS) or an Integrated Instructional System (IIS).

In addition to providing electrical power for PCs, most schools are also considering connecting computing resources (usually throughout a school district) using local networks. Because most elementary and secondary schools do not have multiple telephone lines to classrooms, the use of computers in a networked environment requires either recabling the school, or laying LAN cabling in on top of existing telephone resources. Either approach is complex and expensive, and most school district RFPs for computer resources include a requirement for designing and installing a network capability.

Colleges and universities tend to have better facilities and usually have some centralized computer resource(s) connected via LANs, WANs or MANs to departmental systems and student dormitories. But implementation of expanded computing capabilities at these levels will still require the network resource to which the computers and their communications linkages can be attached.

For schools at all levels, however, mundane items such as telephone and power outlets are like horseshoe nails in battle. Without an adequate supply of them, the battle, or the value of computers in education, is easily lost. With sufficient power and communications interfaces, all things seem possible.

d. Curriculum Reform

Much has been stated in other venues regarding the need for curriculum reform. Stated needs vary from modernizing courses and courseware (e.g. discarding legacy courseware) to improving grading techniques or eliminating grading completely. Computers are not curricula; they are the tools

with which various curricula can be implemented—efficiently and quickly. Computers do have a part in curriculum reform—but that role is as a means, not as an end. Thus, as reforms occur at all levels, there will be a growing role for computers in the educational process.

3. IS Trends in Education

IS activities in education tend to fall into three broad categories—academic courseware and administrative applications for K-12 and higher education; and expanded on-line and CD ROM services for academic libraries. Each area is briefly considered in the following paragraphs.

a. Academic Courseware

There has been steady progress in the acceptance and quality of computer-aided education (CAI) in K-12, where many now regard computer literacy as a fundamental skill. In fact, the U.S. Department of Education estimated that by the fall of 1990, 97.2% of all U.S. K-12 schools used microcomputers—although most schools still feel that PCs are in limited supply. Higher education has been slower to embrace commercial courseware (due to an ingrained belief that university instruction is somehow unique), but there too, acceptance of CAI is growing. The future for such courseware, however, is generally regarded to lie with client/server systems (e.g. IIS or ILS), and for most schools, client/server and the PC will be the vehicles for implementation.

b. Administrative Applications

Although academia is not generally regarded as a business environment, in fact the education process must run with balanced budgets and proper accounting for resources and student achievement. There is an expanding family of K-12 administrative applications designed to improve the management and accounting process and automate record-keeping. Most of these applications are microcomputer-based. In higher education, the major activity is the expansion of local (campus) and national networks to permit effective resource sharing and improved instructor productivity. Administrative applications are also well-received, although many institutions develop their own tailored programs. Most institutions are also exploring the benefits of multimedia instruction. The primary concern is cost, and such systems tend to be as effective as their weakest component.

c. Academic Libraries

Technical areas of primary interest to academic libraries are CD ROM, on-line services, E-Mail and imaging. CD ROM and on-line services are proliferating, with most university campuses offering remote access to many library facilities. Using the same systems and networks, compre-

hensive E-mail systems are also being provided. Imaging offers exciting opportunities for document storage and retrieval, but costs for such systems, even at the lower end, are still prohibitive, and generally out of the reach of academia.

D
Issues

The key IS issues for the K-12 continue to be a cost-sensitivity to IS solutions, which is driven by endemic budget constraints. This condition is a result of funding constraints at all levels (federal, state and local), but may be relieved as the economic turnaround continues, enrollment increases and unemployment drops. Effective teacher computing skills are still in limited supply in the classroom, inconsistent software quality remains a problem, and software vendors still face the profitability dilemma posed by low-margin educational versus high-margin commercial packages. Physical plant limitations (electrical outlets, telephone lines, LANs) are ongoing concerns.

Administrative systems are logical candidates for RDBMS technology, and many campuses are implementing this new technology. The obvious benefit is an integrated administrative system, but concerns include budget limitations and accountability.

Academic libraries (essentially knowledge data bases) are perhaps the most logical beneficiaries of computing technology. Unfortunately, they also have the most limited funding. Most libraries are still years away from offering fully automated search and retrieval systems, with global access to files shared among institutions, business and governments. But many have expanded or added CD ROM and on-line search capabilities, and library consortiums will continue to improve the level of academic information storage and retrieval.

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III

Information Services Market

This chapter discusses the expenditures for information services in the education marketplace. User expenditure forecasts are provided for the education industry by industry sector and 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, accounting, or generic planning and analysis. The markets for these types of information services are presented in cross-industry Market Analysis Program reports rather than in the industry-specific reports.

Note that the numbers used in the exhibits are rounded. Precise values are used in the text and Appendix A, the "Forecast Data Base."

Section A, "Overview," notes the overall size and growth rate of the education market's expenditures for information services.

Section B, "Delivery Mode Analysis," segments the data into INPUT's seven standard delivery modes.

Section C, "Industry Segment Analysis," restructures the forecast in terms of the major market segments within the education industry. These segments are:

- K-12 Administrative
- K-12 Courseware
- Higher Education Administrative
- Higher Education Academic/Courseware
- Academic Libraries

A
Overview

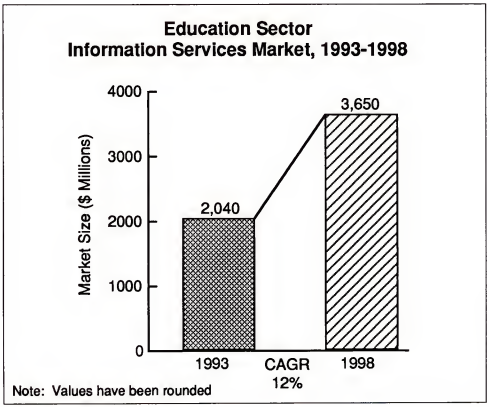
The academic education information services market includes software and services for K-12, colleges (including two-year vocational/technical schools), universities and academic libraries. There are also separate administrative and curriculum courseware markets.

The information services requirements are unique for each of the segments. As a result, most of the companies that provide information services to the academic education markets specifically address one of the three submodes (K-12, higher education or libraries). In addition, companies that produce academic courseware or administrative software usually represent two different vendor types.

The academic education market (as distinct from education and training cross-industry market) in 1993 is expected to be slightly more than $2 billion, or approximately 1% of the $136 billion total information services market forecast for this year.

INPUT projects a 12% CAGR in the total information services market through 1998. The academic education market during the same period is also expected to increase at a compound annual growth rate (CAGR) of 12%, from just over $2 billion in 1993 to $3.65 billion in 1998, as shown in Exhibit III-1.

EXHIBIT III-1



Although the current 5-year growth rate projections for the total IS market and the education market sector are the same, two factors will continue to have an effect on the education sector:

- The flat enrollment projected for elementary schools in prior years has now been adjusted by the National Center for Educational Statistics to reflect a 9% growth rate through the year 2000. Because elementary schools provide the raw material for secondary schools, colleges and universities, enrollment at the senior institutions is now also projected to increase.

- Total public and private school budgets in the United States grew 5.7% from 1991 to 1992, and are expected to continue an annual growth of 5% to 6% over the next five years. However, there is continuing budget sensitivity in all the academic education markets. This sensitivity is a considered response to recent reductions in state aid to education, based in part on changing patterns in student enrollments, cutbacks in federal grants for education, and reductions in the corporate tax base in many inner-city and rural environments. Stated another way, the budgetary concerns are a logical response to the recent prolonged economic slowdown. It is unlikely that there will be any significant budgetary growth (beyond the estimated 5% to 6%) until the tax base and educational program priorities of the new Clinton administration are more fully defined.

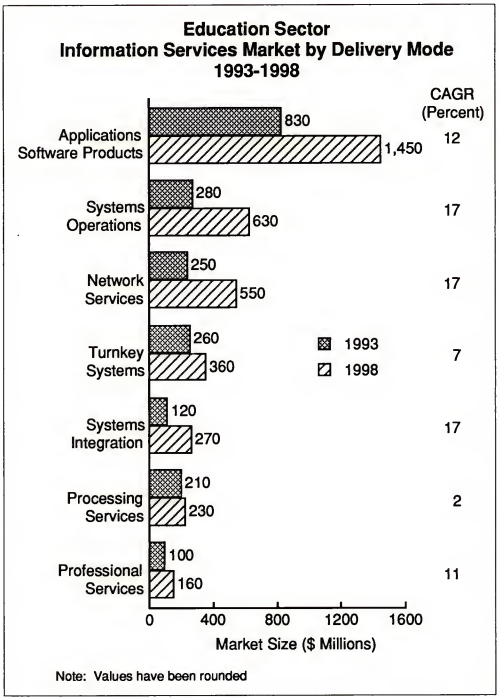
The Clinton administration has indicated an intent to improve the performance of the federally sponsored student loan program (Sallie Mae), but specific details have not yet been released. Under consideration are incentives for loan repayment, public service and work-payback programs, and other means to reduce the high default rate of the present system. How effective such incentives will be, if indeed they are implemented, remains to be seen. There is, however, a strong need to continue providing a pool of funds for those who seek college and post-graduate degrees.

The government is well-motivated to continue providing a source of funds for those who will provide skills offering the U.S. economy a competitive edge in the world labor market. Federal programs are also expected to reflect the need to retrain those portions of the labor force (at all levels), which have been displaced during the recent recession.

B
Delivery Mode Analysis

Forecasts by delivery mode for user expenditures in the education sector are shown in Exhibit III-2. INPUT analyzes the vertical information services markets by seven delivery modes, and the next sections discuss the growth projections for each of those modes.

EXHIBIT III-2



1. Processing Services

INPUT defines processing services for the educational market as transaction processing services. This can involve third-party processing of administrative applications, use of remote supercomputer facilities for research applications, and test scoring and statistical analysis by service bureau-type operations.

Expenditures for processing services in the education information services market will grow at a 2% annual rate, increasing from $205 million in 1993 to $231 million in 1998. The trend toward providing administrative applications on in-house computers has had a negative impact on the growth in processing services. In addition, the local school district service bureau consortiums for administrative applications are not included in the processing services information services market figures because these are considered to be a captive market.

2. Turnkey Systems

Turnkey systems are closely related to processing services in that they both represent a standard, parametric approach to satisfying users' requirements. Both of these alternatives generally provide the least flexibility for the user, and tend to make the user more dependent upon the vendor. They are most frequently used by the smaller schools, which have simple operations and cannot afford the overhead necessary to provide their own data processing capabilities.

Turnkey systems applications integrate systems software, packaged or customized applications software, a CPU, and related equipment and peripherals.

User expenditures for turnkey systems is expected to show the second slowest growth rate, 7%, in the educational information services market over the next five years. From $261 million in 1993, the turnkey systems education market is expected to increase to $363 million in 1998.

The CD ROM market offers an exciting growth opportunity for turnkey systems vendors, particularly in the library environment. In addition, turnkey systems represents a substantial share of the K-12 administrative systems market. This area should continue to provide one of the stronger growth opportunities in the education sector for turnkey systems vendors. Unbundling of hardware and software and related services should also be considered as a competitive opportunity. A significant part of the market also includes test scoring systems delivered as a turnkey systems solution.

3. Application Software Products

The academic educational market for application software products includes courseware, administrative and library software at the K-12 and higher education levels. The educational application software markets are expected to increase from $825 million in 1993 to $1.4 billion in 1998, at a CAGR of 12%. The 1993 market for K-12 courseware is estimated to be $550 million, while $83 million will be spent on courseware for higher education.

The academic educational software industry consists of a large number of companies, including independent academic courseware developers who specialize primarily in the K-12 markets, textbook suppliers (see INPUT's report, Electronic Commerce in the Media *Industry, 1992*), computer systems companies, and turnkey systems suppliers and smaller VARS (whose software revenues are counted under the turnkey systems delivery mode). Although there is major interest in increasing the amount of computer-assisted instruction in the K-12 classrooms by users and vendors (and, in fact, the growth rate is up 25% from the 10% CAGR projected in 1991), there are a number of factors negatively impacting faster growth in this market:

- Ongoing budget constraints for hardware and software
- The need to upgrade classroom computer hardware from older equipment to new, more reliable and user-friendly devices
- The need for more intensive teacher training (staff development) in computer literacy, use and teaching techniques

Client/server applications, especially in an ILS or IIS (see Chapter II) environment, offer an opportunity to blend traditional and computer-aided instruction smoothly in a structured environment. This centralized approach offers efficient equipment utilization, and provides a supportive environment for teachers with limited computer skills.

The commercial courseware market for higher education will continue to remain very small at this time due to the complexity of the courseware required, the expense of developing such programs, and limited budgets. Also, at the college and university level, there is a strong NIH (not invented here) factor, which tends to regard courseware from other sources as useful, but probably not as good or as applicable as software developed by the university's own staff.

The administrative education software markets typically involve different sets of vendors for higher education, K-12, and library administration. The strongest growth potential for these markets is projected to be for those applications that are minicomputer and workstation based.

4. Systems Operations

Systems operations/management involves the outsourcing as part of an institution's computer operations. It can require operation of all the IS data processing facilities—which can be done either on-site or off-site—application development, systems integration, and telecommunications management.

Outsourcing has become a fast-growing market in many industries, and the education sector is no exception. As shown in Exhibit III-2, in 1993 the education sector's systems operations expenditures were $280 million, and are expected to reach approximately $630 million in 1998 with a CAGR of 17%.

As the complexity of computer applications has expanded—in the K-12 and higher education markets—the need for increased networking and distributed/integrated application development has been a stimulus to third-party outsourcing growth. The slower growth rate experienced during the period 1990-1992 was primarily due to longer approval cycles for buying decisions based upon responses to institutional RFPs for outsourcing services. Such delays were a prudent reaction to the economic slowdown. As budget restraints lessen, turnaround times will shorten, and cost-effective systems operations solutions will receive more favorable regard.

5. Systems Integration

The systems integration (SI) market is closely related to the market for professional services. This is the second smallest of the delivery modes. However, it shares the highest projected growth rate (17% CAGR) with the systems operations and network services delivery modes. Whoever bears the responsibility for planning and managing a project is the key distinction between consulting and systems integration. Consulting firms typically provide analytical or technical support to their clients, and seldom bear full responsibility for the result of the project. Systems integrators act as the general contractor on a project, assume project management responsibility and generally bear some financial risk for the success of the project.

The complexity of today's technology, and the industry's accelerating pace of change, makes it increasingly difficult for the user to manage large projects with a combination of in-house and outside resources. As a result, many firms and educational institutions are transferring the risk and responsibility to SI firms.

In general, systems integration involves the delivery of large, multidisciplinary, multivendor systems, incorporating some or all of these functions: systems design, programming, integration, equipment, networks, installation, and acceptance. Systems can also encompass multiple product delivery modes.

The 1993 educational market for systems integration will total $121 million. It is expected to grow at a CAGR of 17% over the next five years and reach $269 million in 1998. (See Exhibit III-2). INPUT's 1992 systems integration delivery mode report forecast the 5-year CAGR (through 1997) for the U.S. SI market at 16%. The education sector's higher growth rate reflects a relatively low starting base and a strong demand at the K-12 level.

One reason for the high growth expectation for systems integration in the educational markets is the need for providing intra- as well as inter-campus networking capability—a task which consists of integrating diverse computers, operating systems, and network architectures. At the K-12 level, there is also a growing need to interconnect local schools with district headquarters, as well as a requirement for providing interactive courseware delivery to improve curriculum quality and cost efficiency.

In higher education, the current use of outside systems integrators is currently limited. Contributing factors include the perceived high cost of long-term contracts, a desire to maintain integration control, and a lack of implementing distributed applications. Currently, much of the use of campus networks, involving E-mail and inter-departmental file exchange, is accomplished through a college or university's mainframe hosts.

6. Professional Services

The professional services delivery mode is defined as a management consulting activity related to information systems consulting, development of custom software, and education and training.

In 1993, the educational market for professional services will be around $98 million. It is expected to grow at a CAGR of 11%, reaching about $162 million in 1998. INPUT is projecting that the overall U.S. professional services market will expand at a CAGR of 9% over the five year period, 1992-1997.

The educational professional services market consists primarily of services provided at the higher education level in association with sales of administrative software and custom software development. In particular, as the software solutions become more complex, there is an increasing need for consulting, education and training support services. In addition, the ability to customize standard solutions is increasing the acceptance of third-party-developed administrative software solutions in the higher education market. The demand for combining software and support services in the higher education market is expected to result in parallel growth for the professional services market and the standalone applications software market.

7. Network Services

INPUT defines the network information services market as consisting principally of value-added networks (VANs), electronic data interchange (EDI), electronic information services (EIS) and E-mail. Electronic information services are defined as data base, news and videotext services.

The educational market for network/electronic services is projected to grow at a 17% annual rate, from $253 million in 1993 to $553 million in 1998, with an expected strong demand for on-line data base delivery and E-mail facilities. INPUT projects that overall, across all U.S. information

services markets, network services will also grow at a 17% CAGR during the five-year period, 1992-1997.

Currently, many education sectors use academic libraries for their on-line data base/news services. Education sectors also use K-12 on-line data base programs to teach research methodologies in the social studies and science curricula. Campuses with advanced networking installations also provide student access to network services from remote locations, such as dormitories.

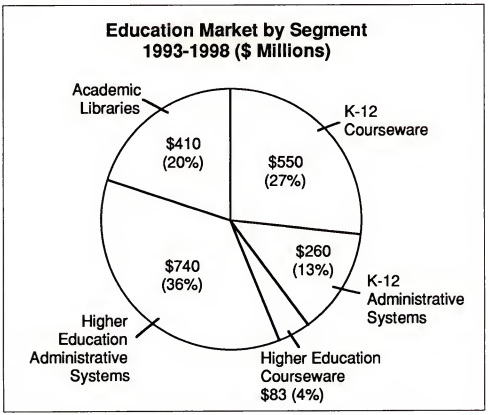
E-Mail is the most common application using network services on campuses today. However, much of this usage is based on mainframe/terminal rather than mainframe/PC communications.

EDI and image processing offer high growth potential for future applications. Such growth will occur in a variety of applications, including intra- and inter-campus student record keeping, and full-text/graphics interchange.

C
Industry Segment Analysis

The size of the education market for 1993, by principal application segment, is shown in Exhibit III-3.

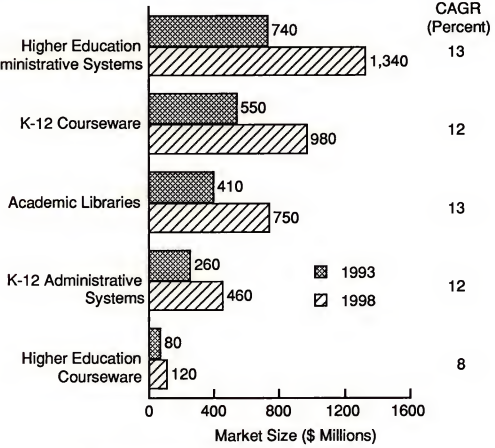
EXHIBIT III-3



The growth rates for the segments of the education industry information services market are provided in Exhibit III-4.

EXHIBIT III-4

Education Sector
Information Services Market by Segment, 1993-1998



Note: Values have been rounded

- The courseware sectors illustrate faster growth in K-12 versus higher education. This condition is driven by the greater acceptance and availability of commercial software for the K-12 segment.

- Administrative systems expenditures at the higher education level are the largest market segment and are growing faster due to the greater availability of funds. In addition, there is a strong need to improve business efficiency and budget performance at the college and university level.

- The use of network services (on-line data bases) and the need to build interlibrary networks fuel the academic library segment's growth.

A

Forecast Data Base

INPUT did not produce a 1992 report for the Education market sector, although a 1992 financial forecast was developed for this marketplace and used to create the *1992 U.S. Information Services Market Forecast.* To provide continuity for the hierarchy of Education Sector financial forecasts, the 1992 forecast, entitled *Education Sector, User Expenditure Forecast by Delivery Mode, 1991-1997*, is included as section C of this of this Appendix. Due to the recency of the analysis, the only reconciliation provided is between the two most current forecasts—those for the periods 1991-1997 and 1992-1998.

A

Forecast Data Base

Exhibit A-1 presents the detailed 1992-1998 forecast for the education sector.

EXHIBIT A-1

Education Sector
Market Size by Delivery Mode, 1992-1998
($ Millions)

Delivery Modes	1992 ($M)	Growth 92-93 (%)	1993 ($M)	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	1998 ($M)	CAGR 93-98 (%)
Sector Total	1,848	11	2,043	2,283	2,561	2,891	3,267	3,650	12
Processing Services	199	3	205	211	217	222	226	231	2
- Transaction Processing	199	3	205	211	217	222	226	231	2
Turnkey Systems	248	5	261	277	295	317	340	363	7
- Equipment	115	4	120	127	135	144	153	162	6
- Software Products	93	6	99	105	112	121	131	141	7
- Applications Software	81	6	86	92	98	106	115	124	8
- Systems Software	12	8	13	13	14	15	16	17	6
- Professional Services	40	5	42	45	48	52	56	60	7
Applications Software	745	11	825	923	1,035	1,165	1,306	1,447	12
- Mainframe	83	2	85	86	88	89	91	93	2
- Minicomputer	182	7	194	210	226	241	255	269	7
- Workstation/PC	480	14	546	627	721	835	960	1,085	15
Systems Operations	245	14	280	325	380	445	535	625	17
- Platform Operations	180	13	204	235	271	310	373	436	16
- Applications Operations	65	17	76	90	109	135	162	189	20
Systems Integration	105	15	121	140	165	200	234	269	17
- Equipment	36	14	41	48	56	68	80	92	18
- Software Products	8	25	10	11	13	16	19	22	17
- Applications Software	5	20	6	7	8	10	12	14	18
- Systems Software	3	33	4	4	5	6	7	8	15
- Professional Services	59	15	68	78	93	112	131	150	17
- Other	2	0	2	3	3	4	4	5	20
Professional Services	90	9	98	110	121	135	148	162	11
- IS Consulting	23	13	26	30	33	39	43	48	13
- Education & Training	13	15	15	17	19	21	23	25	11
- Custom Software	54	6	57	63	69	75	82	89	9
Network Services	216	17	253	297	348	407	478	553	17
- Electronic Information Svcs.	137	18	162	191	225	265	313	363	18
- Network Applications	79	15	91	106	123	142	165	190	16

B
Forecast Reconciliation

Exhibit A-2 presents the forecast reconciliation of the 1992 and 1993 forecasts for the education sector.

EXHIBIT A-2

Education Sector
1993 MAP Data Base Reconciliation
($ Millions)

Delivery Modes	1992 Market				1997 Market				92-97 CAGR per data 92 Rpt (%)	92-97 CAGR per data 93 Rpt (%)
	1992 Report (Fcst) ($M)	1993 Report (Actual) ($M)	Variance from 1992Report ($M)	Variance from 1992Report (%)	1992 Report (Fcst) ($M)	1993 Report (Fcst) ($M)	Variance from 1992Report ($M)	Variance from 1992Report (%)		
Total Education Sector	1,836	1,848	12	1	3,209	3,267	58	2	12	12
Processing Services	196	199	3	2	225	226	1	0	2	3
Turnkey Systems	246	248	2	1	347	340	-7	-2	7	7
Applications Software	740	745	5	1	1,247	1,306	59	5	11	12
Systems Operations	244	245	1	0	532	535	3	1	17	17
Systems Integration	105	105	0	0	234	234	0	0	17	17
Professional Services	89	90	1	1	146	148	2	1	10	10
Network Services	216	216	0	0	478	478	0	0	17	17

There were only minor differences between the 1992 projection for 1992 expenditures and the actual expenditures reported in the 1993 forecast. The maximum variance was a 2% 1992 understatement of processing services revenue. This was due to the lingering effects of the economic slowdown that delayed the anticipated migration of some processing services activities to turnkey or systems operations environments.

Variances in the market projections for 1997 ran from -2% to 5%. Turnkey systems projections have been reduced by 2% to recognize the gradual saturation of the low end (smaller schools) of this market by 1997. Applications software revenue have been increased by 5% as a result of the growing trend toward PC-based client/server courseware, and the increasing acceptance at all levels of vendor-provided administrative systems and applications.

Variances in the 5-year CAGR are minor (1%), and reflect small upward adjustments to the growth rates anticipated for processing services and applications software.

C

1992 Education Sector Forecast

Exhibit A-3 presents the detailed 1991-1997 forecast for the education sector. It provides the basis for the 1992 and 1997 numbers used in the forecast reconciliation in section B of this appendix.

EXHIBIT A-3

Education Sector
Market Size 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	1,659	11	1,836	2,038	2,269	2,537	2,846	3,209	12
Processing Services	191	3	196	201	207	213	218	225	2
- Transaction Processing	191	3	196	201	207	213	218	225	2
Turnkey Systems	231	6	246	265	283	303	324	347	7
- Equipment	111	5	117	128	136	146	155	164	7
- Software Products	83	7	89	95	102	109	117	126	7
- Applications Software	71	8	77	82	88	94	101	109	7
- Systems Software	12	0	12	13	14	15	16	17	7
- Professional Services	37	8	40	42	45	48	52	57	7
Applications Software	667	11	740	821	912	1,012	1,123	1,247	11
- Mainframe	81	2	83	85	86	88	89	91	2
- Minicomputer	169	7	181	195	212	229	248	265	8
- Workstation/PC	417	14	476	541	614	695	786	891	13
Systems Operations	210	16	244	280	323	378	443	532	17
- Platform Operations	154	17	180	204	234	270	309	371	16
- Applications Operations	56	14	64	76	89	108	134	161	20
Systems Integration	91	15	105	121	140	165	200	234	17
- Equipment	31	16	36	41	48	56	68	80	17
- Software Products	7	14	8	10	11	13	16	19	19
- Applications Software	4	25	5	6	7	8	10	12	19
- Systems Software	3	0	3	4	4	5	6	7	18
- Professional Services	51	16	59	68	78	93	112	131	17
- Other	2	0	2	2	3	3	4	4	15
Professional Services	82	9	89	97	107	118	131	146	10
- IS Consulting	20	10	22	25	29	32	38	42	14
- Education & Training	11	18	13	15	16	17	18	21	10
- Custom Software	51	6	54	57	62	69	75	83	9
Network Services	187	16	216	253	297	348	407	478	17
- Electronic Information Services	118	16	137	162	191	225	265	313	18
- Network Applications	69	14	79	91	106	123	142	165	16

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