9/1/87

REPORT PRINTER READY CHECK LIST

DATE: 2/25/88 PROJ. CODE: MSVA-TR

REPORT NAME: TRANSPORTATION SECTOR

AUTHOR: 328

✓ 1. TITLE PAGE

✓ FRONT - REPORT TITLE:

✓ BACK - COPYRIGHT STATEMENT:
- Report Pages on copyright paper

NO 2. ABSTRACT

✓ 3. ~~TITLE~~ CONTENTS PAGE

✓ 4. LIST OF EXHIBITS

✓ 5. CHAPTER TITLE PAGES/COLOR SEPARATORS

✓ 6. APPENDIXES

~~7.~~ EXECUTIVE OVERVIEW

8. TRANSMITTAL LETTER

9. PRESS RELEASE

10. PRINTERS SPECIFICATION FORMS

✓ 11. SOFTBOUND/STITCHED REPORTS

✓ 12. REPORTS FILED IN BINDERS

✓ 13. 'ABOUT INPUT'

***

Market
Analysis and
Planning
Services
(MAPS)

U.S. Information Services Industry-Specific Markets 1987-1992

Transportation Sector

INPUT®

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

DECEMBER 1987

U.S. INFORMATION SERVICES INDUSTRY-SPECIFIC MARKETS, 1987-1992

TRANSPORTATION SECTOR

INPUT®

1280 Villa Street, Mountain View, California 94041-1194

(415) 961-3300

Published by
INPUT
1280 Villa Street
Mountain View, CA 94041-1194
U.S.A.

Market Analysis and Planning Services (MAPS)

U.S. Information Services Industry-Specific Markets, 1987-1992—Transportation

MSVA-TR • 328 • 1987

Table of Contents

Table of Contents (Continued)

Exhibits

I

IV

Exhibits (Continued)

TR-A

I

Issues, Trends, and Events

I

Issues, Trends, and Events

A

Introduction

The transportation industry sector comprises the airline, railroad, trucking, and other transportation segments. Deregulation and economic conditions have contributed to increased competition and consolidation within each of the segments, as well as competition between the modes of transportation and the development of intermodal transportation offerings.

Cost containment, increased productivity and efficiency of operations, as well as improved services offered to customers all rank high as factors in achieving profitability and competing effectively in the deregulated environment.

B

Airlines

The U.S. airline industry is highly concentrated, with twelve major carriers accounting for 84% of all revenue passenger miles at the end of 1986. Sixteen smaller national carriers accounted for about 12%, and regionals, or commuters, accounted for the remaining 4%. Prevalent since 1985, merger and acquisition activities are expected to continue into the near future.

U.S. airlines performed well in 1986, despite a less favorable first half. Although operating profits for 1986 were below 1984 and 1985 levels, the industry was profitable for the fourth year in a row.

While passenger traffic increased, so did airfare discounting. Not only did discounting become more widespread in 1986, but the discounts became larger. The industry continued to benefit from lower fuel prices and, in some cases, lower labor costs. However, these post-deregulation airlines are struggling to restrain costs further, in order to remain both competitive and profitable.

C

Railroads

In recent years, a restructuring of the freight railroad industry has occurred. The end result has been fewer and larger railroads and more intermodal companies. In 1986, the nation's seven largest railroads accounted for 75% of U.S. rail line miles and over 80% of revenues and ton-miles. Intermodal companies have evolved through acquisitions and through cooperative efforts with carriers in other modes, such as trucking and barge operations.

For the year 1986, rail revenue ton-miles were approximately equal to 1985 levels due to improved industrial production in the fourth quarter and the replenishment of coal inventories at electric power plants. During most of the year, however, operating revenues were below 1985 levels due to fuel cost savings being passed on to customers and increased competition from other modes of transportation.

One area of the rail industry—rail piggyback traffic, also known as trailer-on flatcar (TOFC) and container-on flatcar (COFC)—has grown dramatically since deregulation in 1981. These operations require specially designed cars that permit stacking containers two high, doubling the loading capacity of the train, and only slightly increasing costs. Companies that operate ocean liners, with the expertise in operations and marketing required to achieve economies of scale in these type of operations, have teamed up with piggyback rail companies, either through acquisitions or partnerships, forming intermodal operations. Because most of this business involves imported goods traveling west to east, these companies offer reduced rates to ship from east to west, often lower than TOFC and trucking rates.

D

Trucking

Financial pressures have increased for trucking firms operating in the highly competitive deregulated environment. While fuel costs have decreased, labor costs and insurance premiums have increased. The more progressive trucking companies have been able to offset the effects of intense price/service competition by implementing successful marketing strategies and improving efficiencies in operations. Marginal carriers, on the other hand, have been marked by failures, bankruptcies, reorganizations, acquisitions, and mergers.

Growth in less-than-truckload (LTL) business has come from the extension of established LTL carrier systems and through mergers and acquisitions. Growth in LTL business has been accompanied by LTL rate increases and rate discounting by truckload (TL) operations, reflecting shifts in demand for each type of service.

Delivery services on shipments by single-mode truck or intermodal air and truck operations have become very competitive and reliable. The fast-growing air cargo and air express markets have increased competition among surface carriers and intermodal surface and air carrier operations in meeting just-in-time inventory and other requirements.

E

Other Transportation

Other transportation industry segments include air cargo, water transportation, mass transit, postal service, pipelines, and transportation services.

The air cargo industry segment is showing signs of a shakeout similar to that experienced by the passenger airlines since deregulation. Of the largest U.S. air freight carriers, only three or four are expected to survive the next few years.

Future growth in the domestic water transportation industry segment is tied closely to domestic economic conditions. U.S. flagged foreign trade lines are dependent on domestic and international economic conditions and foreign trade.

II

Market Forecasts

II

Market Forecasts

A

Introduction

Demand for transportation industry-specific information services will grow 17% annually through 1992, increasing from $547 million in 1986 to approximately $1.4 billion in 1992. For details, see Exhibits II-1 through II-3 and Appendix Exhibit TR-A-1.

EXHIBIT II-1

TRANSPORTATION SECTOR INDUSTRY-SPECIFIC USER EXPENDITURES 1987-1992

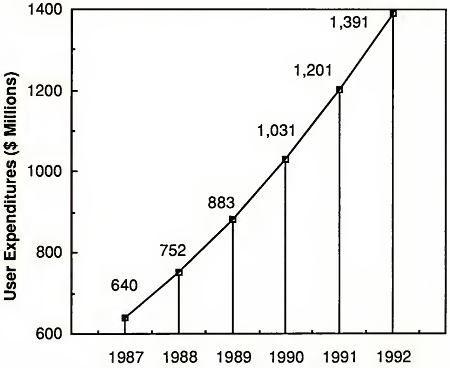
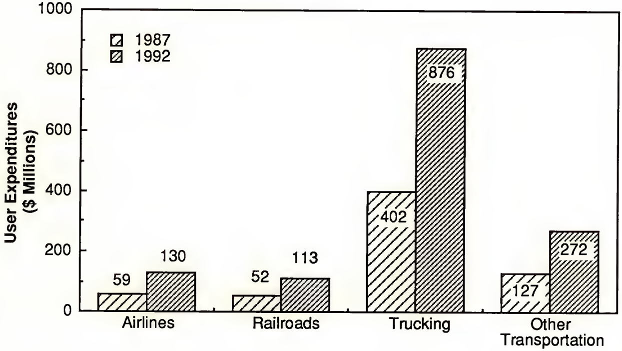


EXHIBIT II-2

TRANSPORTATION SECTOR MARKET FORECAST COMPARISION INDUSTRY-SPECIFIC INFORMATION SERVICES 1987-1992



Transportation user expenditures for information services will increase at an average annual growth rate higher than revenue growth rates expected during the next five years for the following reasons:

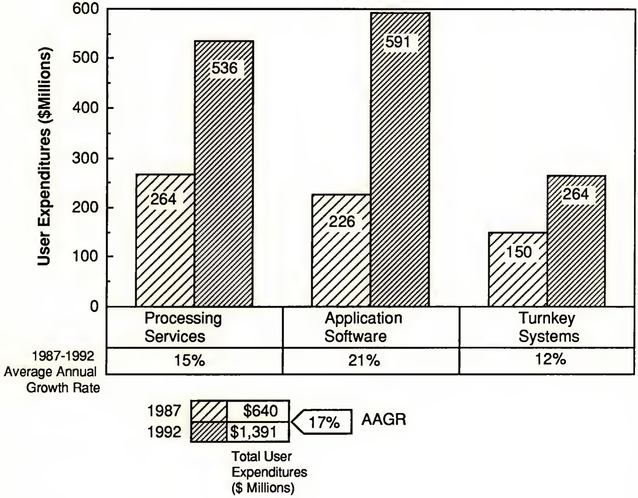
- Information services make a significant contribution toward improving efficiency, containing costs, and thereby increasing profitability, as well as allowing companies to offer additional services to their customers.

- Transportation companies recognize the importance of information systems and new technology and are increasing their investments in these areas.

Appendix TR contains the forecast data base for each year from 1986 to 1992 for the transportation sector as well as for the airline, railroad, trucking, and other transportation segments.

EXHIBIT II-3

TRANSPORTATION SECTOR INDUSTRY-SPECIFIC USER EXPENDITURES FORECAST BY DELIVERY MODE
1987-1992

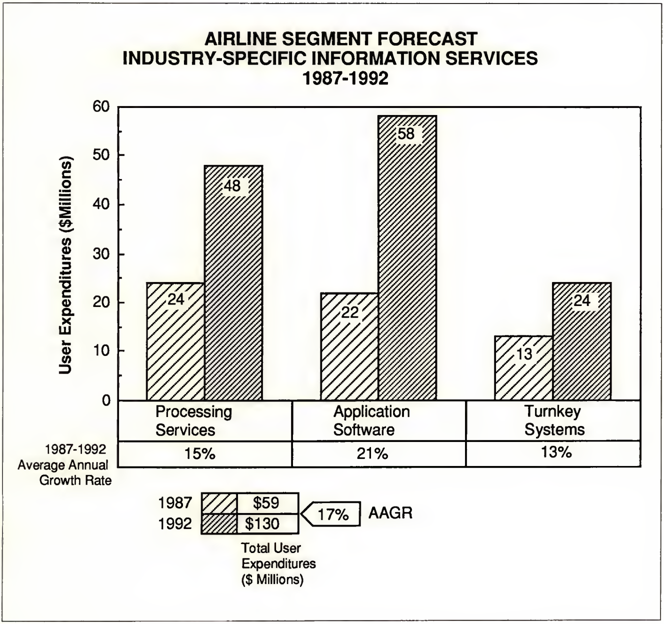


B

Airlines

User expenditures for information services by the airlines will grow 17% annually through 1992, with 1992 expenditures totalling $130 million (see Exhibits II-4 and Appendix TR-A-2).

EXHIBIT II-4



- Expenditures for processing services by the airline segment will grow at an average annual growth rate of 15% over the next five years, reaching $48 million by 1992.

- Application software product expenditures are forecasted to reach $58 million in 1992, growing at an average rate of 21% annually.

- Turnkey systems expenditures will grow to $24 million in 1992, at an average annual growth rate of 13%.

The level of spending for the airline segment will increase over the next five years for the following reasons:

- Airlines will purchase software and other computer services in order to improve profitability by increasing productivity and decreasing labor and other costs.

- Competition will compel the airlines to not only contain costs, but to increase the level of services to customers.

- Information services provide the required data communications between various locations required by this segment.

User expenditures are less for the airline segment than for the trucking and other transportation segments due to the following:

- There are fewer airlines than trucking companies or companies in the other transportation segments.

- Computer services developed by airlines for their own use are not included in INPUT's market size estimates and forecasts.

- Parent organizations often share internally developed systems with subsidiaries and those companies they acquire.

Reservation systems are the systems most prevalent in the airline segment. Financial reporting systems are also ranked high in importance by the segment because of the need for cost measurement and control.

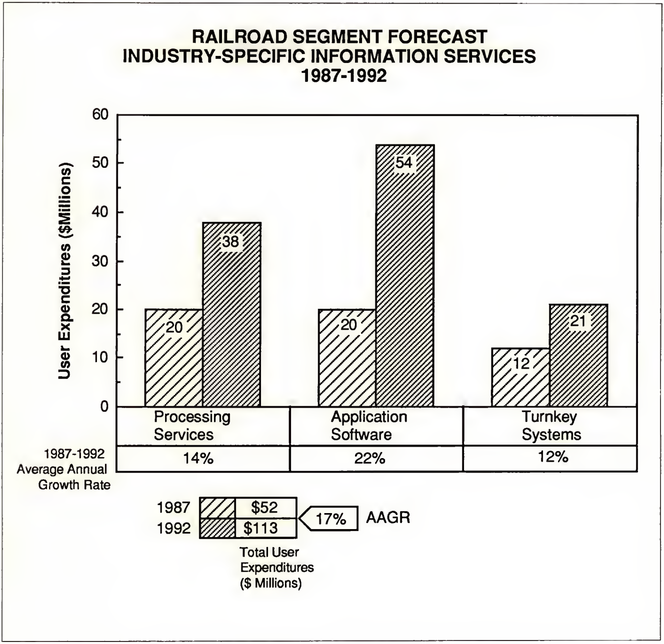
Airlines also use systems for maintenance management, crew scheduling, statistical and revenue reporting, aircraft and mission reporting, and ticket auditing.

C

Railroads

User expenditures for information services in the railroads will grow 17% annually through 1992, with 1992 expenditures totalling $113 million (see Exhibits II-5 and Appendix Exhibit TR-A-3).

EXHIBIT II-5



- Expenditures for processing services by the railroad segment will grow at an average annual growth rate of 14% over the next five years, reaching $52 million by 1992.

- Application software product expenditures are forecasted to reach $54 million in 1992, growing at an average rate of 22%.

- Turnkey systems expenditures will grow to $21 million in 1992, at an average annual growth rate of 12%.

Railroad segment spending for information services will increase over the next five years due to the following:

- New opportunities, such as intermodal transportation, are opening up to the railroads that will allow them to provide additional services to their customers and require increased use of information services.

- Cost containment, efficiency, and profitability are also important to this segment.

User expenditures for information services are less for the railroad segment than for any of the other transportation segments.

- There are fewer railroads than companies in other segments.

- Like the large companies in the airline, trucking, and other transportation segments, railroads have developed computer services for their own internal use, which are not included in user expenditure forecasts.

- In addition, substantial consolidation within the segment has involved a sharing of internally developed resources.

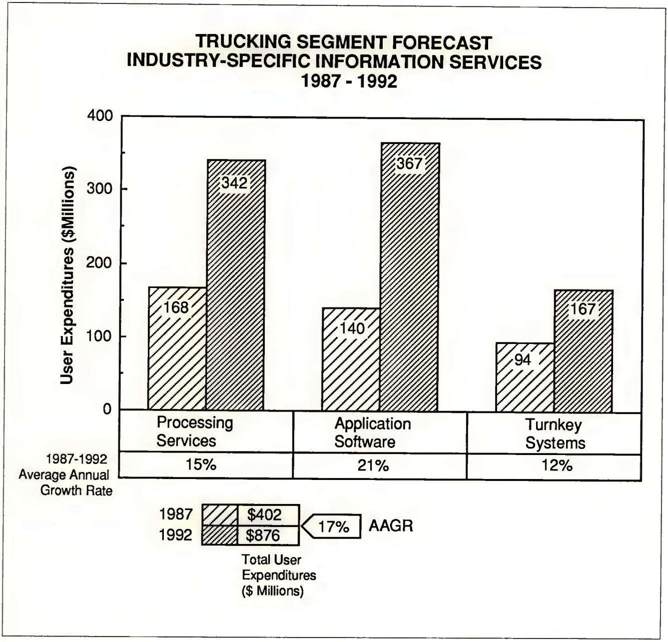
Information systems used by railroads include automated reservation, railcar tracking and management, mileage credit auditing, and other systems.

D

Trucking

User expenditures for information services in the trucking industry segment are expected to grow at an average rate of 17% for the next five years, reaching $876 million by 1992 (see Exhibits II-6 and Appendix Exhibit TR-A-4).

EXHIBIT II-6



TRUCKING SEGMENT FORECAST
INDUSTRY-SPECIFIC INFORMATION SERVICES
1987 - 1992

- User expenditures for processing services in this segment will grow at an average rate of 15%; trucking companies are expected to spend $342 million for processing services in 1992.

- Application software expenditures will grow 21% and reach $367 million in 1992.

- Turnkey systems, growing at an average rate of 12% per year, will grow to $167 million in 1992.

Expenditures for information services by the trucking industry segment represent the largest portion of information services expenditures for the transportation industry for the following reasons:

- Due to easy entrance into trucking and the diverse nature of the business, there are more companies in the trucking segment than in any other transportation segment, even though some consolidation is occurring within the segment.

- Success in trucking lies in developing market niches, which require specialized computer services. Additionally, because the average trucking company is smaller than other types of transportation companies, information services are more often purchased from outside vendors than developed internally.

- In the trucking industry segment, there are innumerous points of transaction, making communications needs even greater for the trucking segment than for other segments.

- Many intermodal forms of transportation involve trucking in some way. The coordination of the different modes requires sophisticated information services.

Some of the many information systems used by the trucking segment are outlined below:

- Freight rate data base and automatic rating system

- On-line system that audits and analyzes freight bills and prevents duplicate payments

- Truck routing and mileage system

- Fuel and mileage reporting system

- Fuel tax and mileage system

- Integrated system for vehicle maintenance, parts inventory, preventive maintenance, scheduling, mechanic statistics, repair orders, and fuel and mileage reporting

- Vehicle routing system that reduces fuel cost by determining the optimum route for the movement of products from shipping points to customer locations

- Integrated system for rating, payroll, freight billing, accounts payable, accounts receivable, shipper and sales analysis reporting, financial statements, trip and mileage reporting, vehicle maintenance, driver settlements, dispatching, and inventory control

- System to calculate haulage booking, accounting, and profitability

- Union contract payroll system

- Driver log system that checks driver violations and missing logs

- On-line system designed for LTL freight companies

E

Other Transportation

User expenditures for the other transportation segments are expected to grow from $127 million in 1987 to $272 million in 1992, at an average annual rate of 16% (see Exhibit II-7 and Appendix Exhibit TR-A-5).

- Processing services expenditures by the other transportation segments are forecasted to grow at an average of 15% per year to reach $108 million in 1992.

- Expenditures for applications will total $112 million in 1992, growing at an average annual rate of 21%.

- Turnkey systems expenditures will reach $52 million, growing at an average of 12% per year.

Applications used by other transportation segments include the following:

- Air cargo reservation and invoicing system

- Water transportation cargo booking system

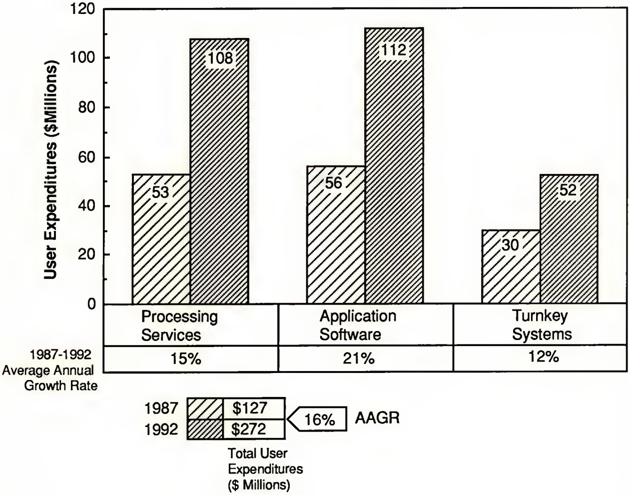
- Container survey reporting system

- Water transport fleet scheduling system

- Marine personnel, payroll, and planning system

EXHIBIT II-7

OTHER TRANSPORTATION SEGMENT FORECAST INDUSTRY-SPECIFIC INFORMATION SERVICES 1987-1992



- Ocean freight cost system
- Terminal control system for operation and control of ocean shipping terminals
- Vessel performance reporting system
- Ferry/cruise reservation and passenger documentation system

- Graphic design program for public transit systems
- Automated transit data-retrieval and route-selection system
- Transit management system for scheduling vehicle maintenance and providing revenue and safety analysis for public and private bus lines or fleet operations
- Computer-assisted packaging evaluation system
- Common carrier service-dependability index
- Real-time freight forwarding system incorporating full export/import procedures, unit load, air freight, and customs procedures
- Management control of large or small vehicle fleets
- Tariff management and freight bill processing
- Traffic rate and routing system for all modes of transportation.

F

Processing Services

User expenditures for remote computing and batch processing services will grow at an average annual growth rate of 16% over the next five years for the transportation industry sector, reaching $506 million in 1992 (see Exhibit II-8 and Appendix Exhibit TR-A-1).

In terms of revenue generated from processing services for the transportation sector, the leader is funds transfer services provided to truckers in transit.

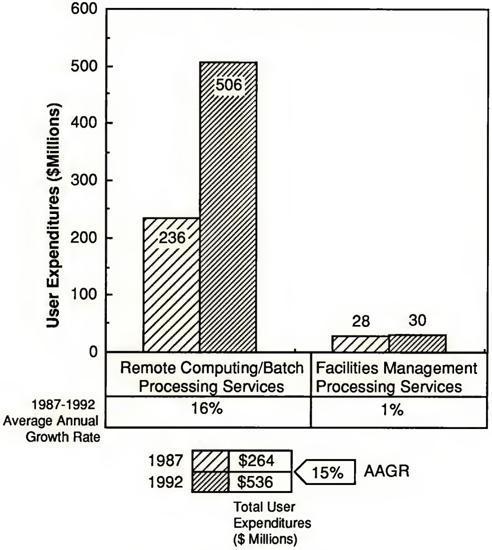
Airline reservation systems, typically provided by the airlines, are also widely used processing services in the transportation industry sector.

User expenditures for facilities management processing services will grow at only 1% annually over the next five years.

As transportation companies become more sophisticated computer users, processing will increasingly be handled in-house. Facilities management services provided by outside vendors will be required only to a limited extent.

EXHIBIT II-8

TRANSPORTATION SEGMENT FORECAST
INDUSTRY-SPECIFIC PROCESSING SERVICES
1987-1992



G

Applications Software

The applications software market for the transportation sector will grow from $226 million in 1987 to $591 million in 1992, at an average annual growth rate of 21% (see Exhibit II-9 and Appendix Exhibit TR-A-1).

User expenditures by the sector for microcomputer applications will increase at an average rate of 23% over the next five years from the relatively small base of $53 million in 1987 to $149 million in 1992.

Expenditures by transportation companies for mainframe and minicomputer applications software will increase from $173 million in 1987 to $442 million in 1992, growing an average of 21% annually.

H

Turnkey Systems

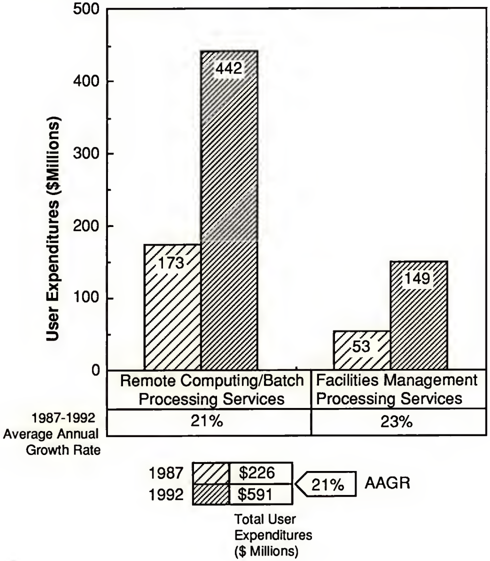
User expenditures from the transportation sector for turnkey systems will grow at an average annual rate of 12% from 1987 to 1992 (see Exhibit II-3 and Appendix Exhibit TR-A-1).

The following types of applications are available to transportation companies as turnkey systems:

- Aircraft maintenance and rotatables system
- Airline reservation system
- Fleet management system
- Driver data system
- Liquid inventory system
- LTL transportation system
- Vehicle maintenance and efficiency system

EXHIBIT II-9

TRANSPORTATION SEGMENT FORECAST INDUSTRY-SPECIFIC APPLICATIONS SOFTWARE 1987-1992



III

Competitive Developments

III

Competitive Developments

A

Introduction

The transportation sector is characterized by relatively few large processing services vendors and a widely diversified group of applications software and turnkey systems vendors. This diverse group includes hundreds of small companies providing computer services to transportation and other industries as well as larger companies with only a very small portion of their revenues generated from industry-specific products sold to the transportation industry.

Overlap exists between the industry-specific applications used by transportation companies and companies in other industries involving distribution, such as manufacturing, wholesale and retail distribution. Fleet management systems and vehicle maintenance systems are used by many types of companies. In addition, overlap exists between the systems used by the various transportation segments.

Many airlines, railroads, trucking firms, and other transportation companies have developed applications for internal use and are now marketing these products externally.

B

Vendor Profiles

1. Comdata Network, Inc. (2209 Crestmoor Road, Nashville, TN 37215)

Comdata Network, Inc. provides funds transfer services to the trucking industry and offers check verification processing services for retail establishments. Comdata's processing services for the transportation industry include Comchek and Express Comchek Funds Transfer Services, Fuel Purchase Program, Permit Transfer Program, and COMVOY Shipment Interchange Program. Funds transfer services are provided to individual credit card holders through Comdata Service Centers located at truck stops, gambling casinos, motels, hotels, and college campuses.

2. Cass Information Systems (1015 Locust Street, St. Louis, MO 63101)

Cass Information Systems provides the following applications to the transportation industry via processing services utilizing a Tandem NON-STOP TXP computer:

- Transdata, a reporting system designed to monitor and reduce the cost of inbound and outbound freight
- Transaction, a data base information system used to manage and update historical transportation information
- Freightpay, an accounts-payable system that can handle freight payments and maximize cash flow
- Rate-Chek, a freight-billing auditing system that can be used in preaudit, immediate audit, and postaudit environments
- Translink, a financial control system that matches preauthorized order records of transportation activities with related freight expenditures
- Compu-Rate, a client-based rating system including computer rating, computer auditing, tariff maintenance, rate quotation, prepay and add invoicing, and shipment planning

3. FundsNet, Inc. (385 Nordhoff Place, Englewood, NJ 07631)

FundsNet, Inc. provides electronic funds processing and transfer services to the transportation industry and the consumer public and provides credit card processing services to retail establishments and the travel and entertainment industry.

- Dial-a-Check offers trucking companies a method of transferring funds to their drivers while enroute.
- Action Check, an enhancement to Dial-a-Check, enables trucking companies to provide their drivers with preauthorized coded vouchers for presentation at service centers.
- National Purchasing System makes use of Dial-a-Check via FundsNet plastic identification cards that are issued by transportation companies to their drivers.
- Cashcall services are offered at resort hotels, race tracks, casinos, and campgrounds across the U.S., as well as Puerto Rico and the Bahamas. Consumers obtain cash transfers using VISA or MasterCard at FundsNet and other terminals.

4. United Airlines Apollo Services (P.O. Box 66100, Chicago, IL 60666)

United Airlines' computerized reservation system, Apollo, provides travel agents access to listings for all major airlines as well as for hotels, car rentals, and other travel-related services. In addition to reservation processing, the system provides services such as the Apollo Business System, an office automation application for travel agents that has facilities for accounting, reporting, and other office automation functions.

5. Cogito Data Systems (1101 State Road, Princeton, NJ 08540)

Cogito Data Systems, acquired in 1986 by IntelliTEK Computer Corporation, provides processing and professional services for large vehicle fleet maintenance and management, as well as processing and turnkey systems for educational institutions. Processing and professional services for fleet maintenance and management are provided for government and utilities customers through Cogito's operating subsidiaries, Mainstem Corporation and Mainstem Canada Ltd. Another Cogito subsidiary, Automated Fleet Systems Inc., provides computer services for maintenance and management of large vehicle fleets, primarily for private companies and common carriers.

6. Distribution Sciences, Inc. (1350 E. Touhy Avenue, Des Plains, IL 60018)

Distribution Sciences provides the following applications software products to the transportation industry: MATCHPAY, PreShipment Planning, Base Rate, and ZIP Rate PC. With the exception of ZIP Rate PC, these products run on IBM 370, 43XX, and 30XX systems.

Distribution Sciences also provides processing services, including Auto Rate, a freight rating service, and Frate Bank, which offers access to various transportation data bases and software, such as freight rating, carrier selection, distribution analysis, and analysis of carrier tariffs.

7. Trans Tech Services, Inc. (4309 Hacienda Drive, Pleasanton, CA 94566)

Trans Tech Services provides operations planning and control systems for the transportation industry and private carriers. The ROUTE/Control system is designed to help private fleets plan and control daily operations, reduce operating costs, and increase labor efficiency and equipment utilization. The system includes workstations, a routing and scheduling process, and a computer-generated road map of the service territory. The DISPATCH/Control system, designed for the common carrier industry, enables management to plan and control the daily functions of delivery operations, customer service, delivery routing and scheduling, and communication with drivers.

8. Railinc Corporation (1920 L Street N.W., Washington, D.C. 20006)

Railinc is a wholly owned subsidiary of the Association of American Railroads (AAR), providing information and communications services, including electronic data interchange (EDI) services, industry data bases (statistics, rate information), customized software, and computer timesharing. The two principal EDI products are SAM (Shipper Assist Message service) for high-volume needs and CARLO (Car Location message dial-in service) for low volume needs.

9. ATA Services, Inc. (2200 Mill Road, Alexandria, VA 22314)

ATA Services provides TRANSPRO via processing services, as a turnkey system, or as a standalone application software product. TRANSPRO is sold to the American Trucking Association and other trucking companies and contains modules for the following: freight billing, freight accounting, revenue analysis, freight settlements, vehicle maintenance, fuel and mileage reporting, electronic data interchange, and general accounting.

10. Optimal Decision Systems (4380 Malsbary Road, Cincinnati, OH 45242)

Optimal Decision Systems provides the following microcomputer application software products to the trucking segment of the transportation industry:

- Distance Plus provides trip planning and sequencing of stops for minimum distance routing.

- Micro-LMS, a decision support system, uses optimization techniques to model logistics networks.

- Optimal Load Runner is a carrier selection and management system that uses optimization techniques to assign truckload and LTL carrier capacity to shipments.

- Optimal Pathfinder analyzes economics of fleet operations and calculates the best mix of transportation resources.

- Optimal Consolidation is a system used to create consolidated multistay truckloads from a set of LTL orders.

IV

Information Systems Department Issues

IV

Information Systems Development Issues

A Major Issues

1. Issues and Objectives

Key issues for transportation company IS departments include cost control and profitability, company productivity, information access, communications, and improved services to end-user departments as well as to customers.

- Cost control is essential to transportation companies operating in the deregulated environment. IS managers are searching for ways to improve productivity both in developing and implementing information services, as well as in providing transportation services.
- IS departments are acutely aware of the need for information. Managers need information to make decisions quickly. For example, the airlines use information systems to determine how much discounting must be done in order to maximize revenues. LTL trucking operations use information systems for packing and routing shipments to improve productivity and maximize revenues.
- Communications needs are especially high in the transportation industry due to the many remote sites involved. These sites are often mobile, which presents additional challenges.
- Customers in the transportation industry increasingly expect new services. IS departments must find ways of providing these services so that their companies remain competitive. For example, IS departments implement systems that permit customers to pinpoint the location of goods being shipped at any given time. Other customers require the electronic transfer of data for billing, orders, and routing (EDI).

The following objectives, identified by IS managers, center on profitability and remaining competitive:

- Reduce costs, including equipment maintenance and personnel costs, while maintaining the resources needed to develop new systems and maintain existing systems
- Develop new applications, while improving the application development process. This process involves obtaining better tools for the application development staff
- Develop efficient data communications networks to improve data transfer between various points of transaction involving customers, as well as within their organizations
- Select and implement software products and other information services that will fulfill the requirements of end-user departments and improve service offerings to customers
- Purchase hardware which will meet management's needs and be most reliable and cost-effective in the long run

Key issues and objectives for IS managers in the transportation industry are shown in Exhibits IV-1 and IV-2.

EXHIBIT IV-1

TRANSPORTATION: KEY ISSUES

- Cost Control/Profitability
- Improved Company Productivity
- Information Access/Communications
- Improved Services to User Departments and Customers

EXHIBIT IV-2

TRANSPORTATION: OBJECTIVES

- Reduce Costs/Increase Profitability
- Increase Transportation System Productivity
- Increase Programmer Productivity
- Improve Application Development Process
- Develop/Implement Applications for Improved Customer Services
- Improve Data Communications Networks
- Purchase Hardware

2. Impact of New Technology

Transportation companies gain their respective competitive advantages through the use of information technology by increasing productivity, decreasing costs, and improving customer services. Often, in the deregulated environment, these items are essential for a company to even remain in operation.

Information technology, such as data communications, is especially important to transportation companies due to the volatile and very competitive nature of the industry. In addition, innumerous points of transaction are characteristic of the industry. Data communication networks relay essential, current information to managers for decision making in areas such as pricing. These networks also provide ways to offer additional services to customers, such as shipment tracking and electronic billing.

Exhibit IV-3 outlines the impact of new technology on the transportation industry.

EXHIBIT IV-3

TRANSPORTATION: IMPACT OF NEW TECHNOLOGY

- Increased Productivity
- Lower Costs
- Improved Customer Services
- Data Transfer within Organization
- Data Communication between Points of Transaction
- Applications at User Department Levels

B

New Applications

INPUT's respondents reported that 50% of major new applications planned for 1988 will be developed internally. Eleven percent of the major projects planned will be contracted out fully to professional services organizations. The remaining 39% will be combination efforts involving both internal application development staff and external professional services organizations (see Exhibit IV-4).

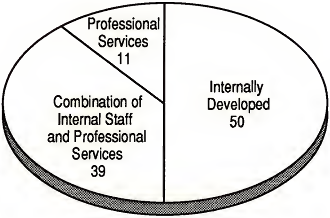
Respondents identified the following cross-industry and industry-specific applications to be implemented in 1988:

- Budgeting
- General Ledger
- Accounts Payable
- Accounts Receivable
- Fixed Assets
- Integrated Accounting
- Frequent Flyer Accounting
- Payroll
- Flexible Benefits
- Crew Management
- Enhancements to Reservation System
- Scheduling
- Logistics Control
- Materials Management

EXHIBIT IV-4

TRANSPORTATION: SOURCE OF DEVELOPMENT OF MAJOR APPLICATIONS

(Percent)



- Maintenance Management
- Shipping/Invoicing
- EDI
- Sales Tax
- Simplified Rating
- Sales Analysis
- Yield Management
- Exception Reporting
- Flight Operations
- Data Base Management
- Desktop Publishing
- Image Processing
- Private Networks

C

Budget Analysis

IS budgets as a percentage of total corporate revenue averaged 1.0% for transportation respondents in 1987. During 1987, IS spending for the group increased an average of 2% over 1986. However, the corresponding group of transportation respondents surveyed by INPUT during 1986 expected to increase spending approximately 10% in 1987. Plans to increase spending for information systems were modified due to increased price competition, resulting in less than expected revenue levels, and continued restructuring of the industry, leading to consolidation.

Respondents whose IS budgets increased in 1987 attributed increases to corporate growth, IS personnel expenses, computer hardware, communications, and the implementation of new applications. IS managers in the transportation industry expect to increase spending for information services by 7% in 1988. Exhibit IV-5 shows the 1987 budget distribution and projects the growth of budget categories in 1988. As in 1987, the most significant budget increases for 1988 will be in the areas of IS personnel, computer hardware, and communications.

IS personnel will be involved in developing and implementing new applications, as well as enhancing and maintaining existing systems. According to respondents, 30% of applications development personnel within IS organizations are assigned to the development of new systems, 33% are assigned to the enhancement of existing systems, and 37% are assigned to the maintenance of existing systems (see Exhibit IV-6).

Increases in hardware budgets for 1988 were consistent (5–6%) across all categories of hardware—mainframes, minicomputers, microcomputers, mass storage devices, and other hardware, including peripheral devices—although allocation of the total IS budget to each of these categories of hardware varies.

Many companies currently handle voice communications separately from the IS budget. Respondents with IS budgets that include both data and voice communications plan to increase spending in both areas during 1988.

Respondents reported that total corporate IS expenditures included the corporate IS budget as well as some information systems expenditures of end user departments. However, user departments are generally responsible for purchasing PCs and other related items. Processing services, such as on-line data base access, are also often purchased directly by user departments. In addition, some IS expenditures are charged back to user departments. IS managers indicated a trend toward charging more of their services back to the user departments.

EXHIBIT IV-5

TRANSPORTATION:
1987 BUDGET DISTRIBUTION AND
1988 PROJECTED GROWTH

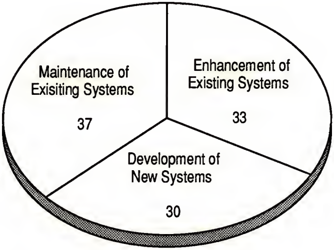
BUDGET CATEGORY	PERCENT OF 1987 IS BUDGET	1988 PROJECTED GROWTH (% +/-)
Personnel Salaries and Fringes	43	8
Mainframes	10	6
Minicomputers	3	5
Microcomputers	1	5
Mass Storage Devices	3	6
Other Hardware	5	6
Total Hardware	22	6
Data Communications	7	6
Voice Communications	5	5
Total Communications	12	6
Professional Services	5	2
Processing Services	0*	10
Application Software	1	2
System Software	3	3
Hardware Maintenance	8	1
Software Maintenance	2	4
Total External Products/Services	19	5
Other	4	4
TOTAL	100	7

* Less than 1%

EXHIBIT IV-6

TRANSPORTATION: ASSIGNMENT OF APPLICATIONS DEVELOPMENT STAFF

(Percent)



V

New Opportunities

A

Integrated Systems

An excellent opportunity for information services vendors providing systems for the transportation industry lies in integrated systems that combine several industry-specific applications. For example, the trucking industry uses integrated systems that combine vehicle maintenance, parts inventory, preventive maintenance, scheduling, mechanic statistics, repair orders, and fuel and mileage reporting.

Transportation companies also require systems that provide cross-industry type applications such as accounting, financial reporting, payroll, human resource management, inventory control, and planning and analysis, which are tailored to meet their industry segment requirements and are integrated with very industry-specific applications related to their particular market niches. Market niches in the transportation industry include overnight air express and piggy-back railroad operations.

B

Intermodal Transportation Systems

The development of intermodal transportation offerings has provided many opportunities to information services vendors targeting the transportation industry. Intermodal offerings include surface/air cargo operations, trucking/railroad operations, oceanliner/railroad operations, and more. Packing, routing, invoicing, and tracking involved with containership businesses require sophisticated information systems to ensure on-time delivery at a competitive price.

C

Communications

Many opportunities are also opening up for transportation industry information services in the area of data communications. Electronic data interchange (EDI), local area networks, and satellite communications provide the means for applications to be brought down to the vehicle level and for information to be transmitted to and from the appropriate points.

D

EDI

Large transportation companies have the resources required to become involved with EDI, making these services an excellent opportunity for information services vendors. Even the typically smaller trucking companies are benefitting from EDI with improved efficiencies and increased customer services, due to the availability of affordable computer systems.

Often, incentives are provided to companies for using these services. The U.S. Customs Service, which controls cargo movement through U.S. ports, is promoting EDI in order to cut paperwork. Transportation companies in particular benefit from EDI because of the many locations involved in transactions.

VI

Conclusions and Recommendations

VI

Conclusions and Recommendations

Information vendors targeting the transportation sector need to provide systems that center on containing costs, increasing the productivity of IS and other personnel, and improving the efficiency of transportation systems.

Information systems must address the specific requirements of particular market niches within the transportation sector, such as LTL trucking operations and TOFC rail operations. Transportation companies also want integrated systems that combine cross-industry applications—accounting, finance, inventory control, and human resource management—with industry-specific applications for their particular market niches.

The systems should enable transportation companies to offer their customers additional services which are clearly recognizable to these customers as a benefit, such as cost savings, just-in-time services, or the ability to pinpoint the location of a shipment at any time.

In addition, information services vendors should provide services which will inevitably be implemented by much of the targeted industry—services such as EDI, which will be used by transportation companies to compete successfully in terms of both pricing and service offerings.

TR-A

Appendix: Forecast Data Base

TR-A

Appendix: Forecast Data Base

This appendix contains the following forecast information, as shown in Exhibits TR-A-1 through TR-A-5:

- Transportation industry sector market size by delivery modes for each year 1986-1992.
- Transportation industry sector market growth rates for 1986-1987.
- Transportation industry sector average annual growth rate (AAGR) for each delivery mode for the five-year period 1987-1992.
- Market sizes by delivery mode, 1986-1987 market growth rates, and AAGRs for the period 1987-1992 are also presented for transportation industry segments including airlines, railroads, trucking and other transportation.

EXHIBIT A-1

TRANSPORTATION INDUSTRY SECTOR INDUSTRY-SPECIFIC USER EXPENDITURES FORECAST
1987-1992

Segmentation by Delivery Mode	($ M) 1986	86-87 Growth (Percent)	($ M) 1987	($ M) 1988	($ M) 1989	($ M) 1990	($ M) 1991	($ M) 1992	AAGR 87-92 (Percent)
Processing/Network Services									
Remote Comp/Batch	212	11	236	269	312	365	431	506	16
Facility Management	27	4	28	29	29	29	30	30	1
Total Processing Services	239	10	264	298	341	394	461	536	15
Applications Software									
Mainframe/Mini	140	24	173	213	260	314	374	442	21
Micro	34	56	53	73	94	112	130	149	23
Total Application Software	174	30	226	286	354	426	504	591	21
Turnkey Systems	134	12	150	168	188	211	236	264	12
Sector Total	547	17	640	752	883	1,031	1,201	1,391	17

EXHIBIT A-2

AIRLINE INDUSTRY SEGMENT
INDUSTRY-SPECIFIC USER EXPENDITURE FORECAST

Segmentation by Delivery Mode	($ M) 1986	86-87 Growth (Percent)	($ M) 1987	($ M) 1988	($ M) 1989	($ M) 1990	($ M) 1991	($ M) 1992	AAGR 87-92 (Percent)
Processing Services	21	14	24	27	31	36	42	48	15
Applications Software	16	38	22	27	33	40	48	58	21
Turnkey Systems	13	0	13	15	17	19	21	24	13
Total	50	18	59	69	81	95	111	130	17

EXHIBIT A-3

RAILROAD INDUSTRY SEGMENT
INDUSTRY-SPECIFIC USER EXPENDITURE FORECAST

Segmentation by Delivery Mode	($ M) 1986	86-87 Growth (Percent)	($ M) 1987	($ M) 1988	($ M) 1989	($ M) 1990	($ M) 1991	($ M) 1992	AAGR 87-92 (Percent)
Processing Services	18	11	20	22	25	29	34	38	14
Applications Software	14	43	20	25	31	37	44	54	22
Turnkey Systems	12	0	12	14	16	18	20	21	12
Total	44	18	52	61	72	84	98	113	17

EXHIBIT A-4

TRUCKING INDUSTRY SEGMENT
INDUSTRY-SPECIFIC USER EXPENDITURE FORECAST

Segmentation by Delivery Mode	($ M) 1986	86-87 Growth (Percent)	($ M) 1987	($ M) 1988	($ M) 1989	($ M) 1990	($ M) 1991	($ M) 1992	AAGR 87-92 (Percent)
Processing Services	151	11	168	190	217	251	294	342	15
Applications Software	102	37	140	178	221	266	314	367	21
Turnkey Systems	91	3	94	105	117	131	147	167	12
Total	344	17	402	473	555	648	755	876	17

EXHIBIT A-5

OTHER TRANSPORATION INDUSTRY SEGMENT INDUSTRY-SPECIFIC USER EXPENDITURE FORECAST

Segmentation by Delivery Mode	($ M) 1986	86-87 Growth (Percent)	($ M) 1987	($ M) 1988	($ M) 1989	($ M) 1990	($ M) 1991	($ M) 1992	AAGR 87-92 (Percent)
Processing Services	48	10	53	59	68	78	91	108	15
Applications Software	32	38	44	56	69	83	98	112	21
Turnkey Systems	29	3	30	34	38	43	48	52	12
Total	109	17	127	149	175	204	237	272	16

About INPUT

INPUT provides planning information, analysis and recommendations to managers and executives in the information processing industries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions. Continuing services are provided to users and vendors of computers, communications, and office products and services.

The company carries out continuous and in-depth research. Working closely with clients on important issues, INPUT's staff members analyze and interpret the research data, then develop recommendations and innovative ideas to meet clients' needs. Clients receive reports, presentations, access to data on which analyses are based, and continuous consulting.

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

Formed in 1974, INPUT has become a leading international planning services firm. Clients include over 100 of the world's largest and most technically advanced companies.

Offices

NORTH AMERICA

Headquarters
1280 Villa Street
Mountain View, CA 94041
(415) 961-3300
Telex: 171407
Fax: (415) 961-3966

New York
Parsippany Place Corp. Center
Suite 201
959 Route 46 East
Parsippany, NJ 07054
(201) 299-6999
Telex: 134630
Fax: (201) 263-8341

Washington, D.C.
8298C, Old Courthouse Rd.
Vienna, VA 22180
(703) 847-6870
Fax: (703) 847-6872

EUROPE

United Kingdom
41 Dover Street
London W1X3RB
England
01-493-9335
Telex: 27113
Fax: 01-629-0179

ASIA

Japan
FKI
Future Knowledge Institute
Saida Building,
4-6, Kanda Sakuma-cho
Chiyoda-ku,
Tokyo 101,
Japan
03-864-4026
Fax: 011-03-864-4114

INPUT®
Planning Services for Management