

INFORMATION SERVICES INDUSTRY

ANNUAL EXECUTIVE PRESENTATION

1987

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INFORMATION SERVICES INDUSTRY DIRECTIONS

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NOTES:

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MPRE-1

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INFORMATION SERVICES M PRE
INDUSTRY 1987
ANNUAL EXECUTIVE PRESENTATION C. 2

AUTHOR

TITLE

DATE
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BORROWER'S NAME



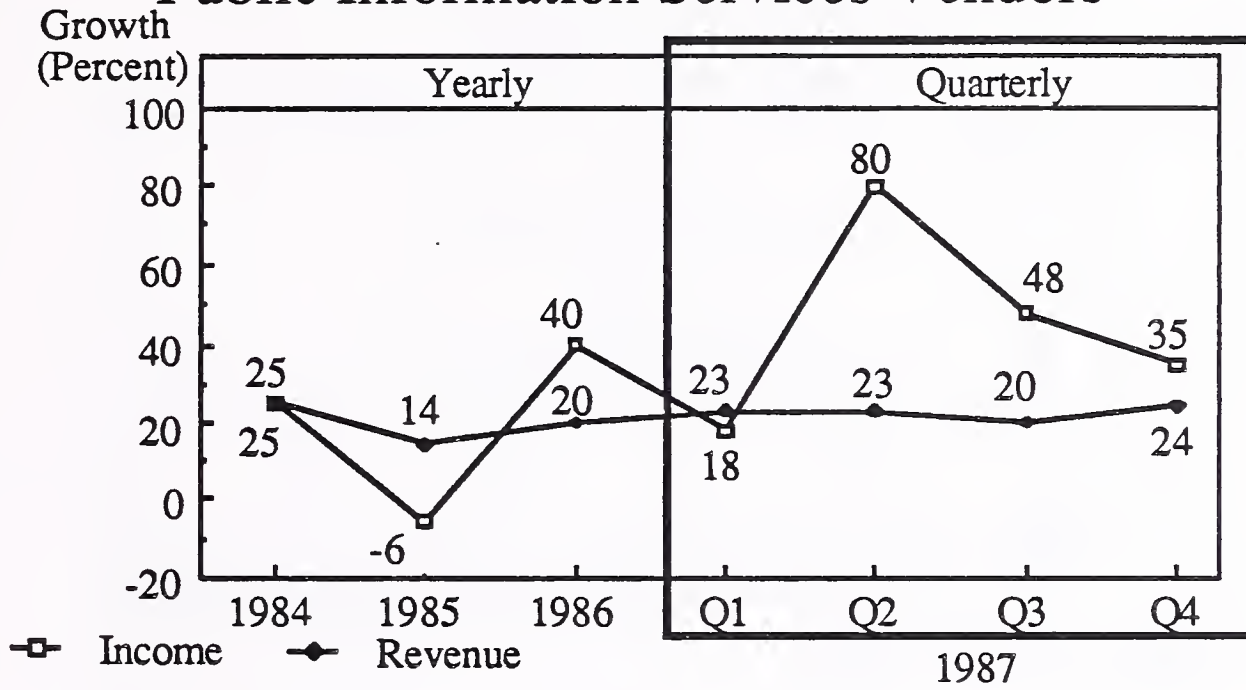
- OVERVIEW -
STATUS OF THE INDUSTRY

INPUT

NOTES:

MPRE-2

Public Information Services Vendors

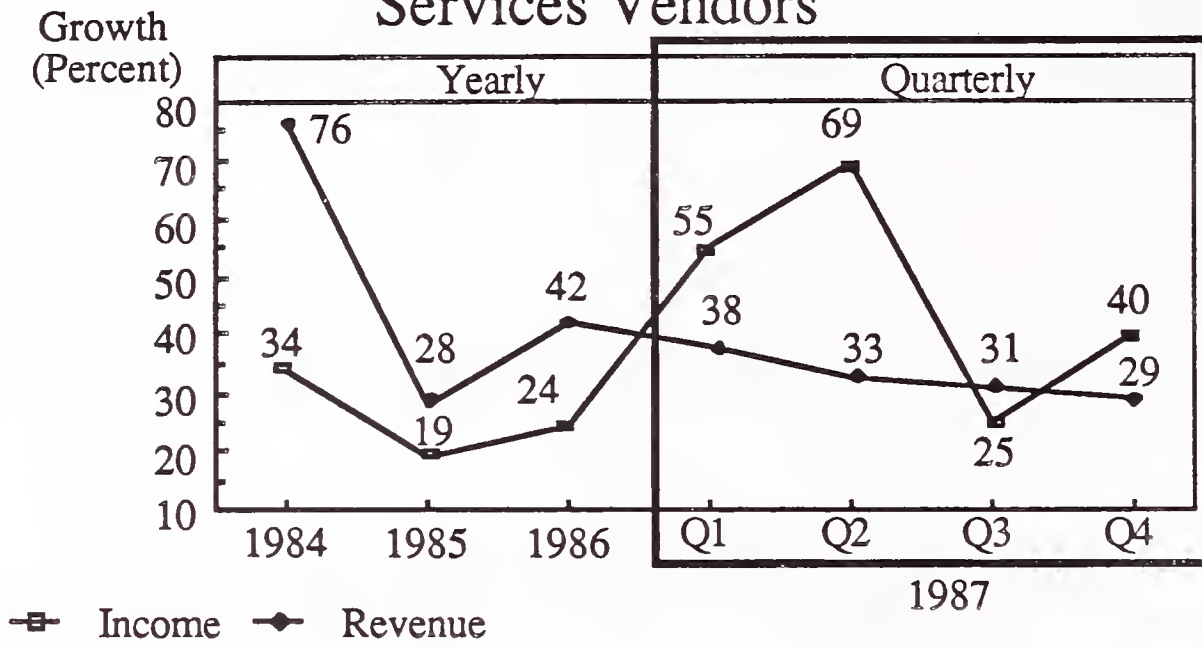


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NOTES:

MVFW Q4 MPRE-3

Public Electronic Information Services Vendors



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NOTES:

MVFW Q4 MPRE-3a

KEY EVENTS

- Processing Services
 - FCC Local Access Charge
- Software Products
 - Distribution: Telemarketing
 - IBM Actions
 - SAA
 - ASD

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NOTES:

MPRE-4

KEY EVENTS

(Continued)

- Professional Services
– Systems Integration
- Turnkey Systems
– Direct Sales by Manufacturer
- Market
– Mergers/Acquisitions/Alliances

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NOTES:

MPRE-5

MACRO ISSUES INFORMATION SERVICES

- Focusing on End User Needs (Vertical)
- Complexity Begets Customization
- Implementation Skill Mix Shortfall
Begets Professional Services Boom
- Competitive Advantage Fuels Systems
Integration
- Alliance Selection and Formation

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NOTES:

MPRE-6

IBM STATUS

IN INFORMATION SERVICES INDUSTRY

- Processing Services
 - Information Network/SIS (EDI)
- Software Products
 - System Application Architecture
 - Applications System Division

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NOTES:

MPRE-7

IBM STATUS
INFORMATION SERVICES INDUSTRY
(Continued)

- Professional Services
 - Systems Integration
 - Segment Focus
- Turnkey Systems
 - Serious Evaluation!

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NOTES:

MPRE-8

ENVIRONMENT

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NOTES:

MPRE-9A

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1988 FORECAST -
IMPACT OF
STOCK MARKET
VOLATILITY

INPUT

NOTES:

MPRE-9B

INPUT

FACTORS CAUSING THE STOCK MARKET PLUNGE-1987

- International Trade Deficits
- U.S. Budget Deficit
- Falling Dollar
- Rising Interest Rates
- Insufficient Specialist Financing
- Insider Trading
- AND
- PANIC SELLING

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NOTES:

MPRE-9C

INPUT

EFFECTS OF LOWER STOCK PRICES

- Capital Formation
- Initial Public Offerings (IPOs) Postponed
- Secondary Placements-Lower Valuations
- Mergers and Acquisitions Delayed

AND

- Possible Regulatory Changes

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NOTES:

MPRE-10

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MAJOR INDICATORS REPORTED SINCE BLACK MONDAY - U.S. ECONOMY

- Manufacturing Capacity Utilization at 81.4%
- Unemployment at Lowest Level in 10 Years
- Company Profits at Near All-Time Rate
- Personal Income Surge Highest Since WWII

INPUT

NOTES:

MPRE-11A

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MAJOR INDICATORS REPORTED SINCE
BLACK MONDAY - U.S. ECONOMY
(CONT.)

- Machine-Tool Orders Increased 46% in
October Over September
- Factory Orders Increased by 1.1% in October
Over September Which Was Up 1.8%
- Economic Indicators Decline Only .2% in
October Mostly Due to a Decline in Stock Market*

* If Market Stayed the Same the Economy Indicators
Would Have Been Up .9%

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NOTES:

MPRE-11B

INPUT

MAJOR INDICATORS REPORTED
SINCE BLACK MONDAY
WORLD ECONOMY

- European Banks Cut Key Rates
- Efforts to Stabilize Dollar, Spur Growth

- West Germans Develop Plan to
Ease Credit

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NOTES:

MPRE-12A

INPUT

MAJOR INDICATORS REPORTED
SINCE BLACK MONDAY
WORLD ECONOMY (Cont.)

- Oil Prices Fall in Moderate Trading
- U.S., Canada Get New Trade Pact
- \$17.6 Billion Trade Gap Stuns Analysts

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NOTES:

MPRE-12B

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PERCENT GROWTH BY
DELIVERY MODES
1978-1982

YEAR	Proc./ Network Services	Software Prod.	Prof. Services	Turn- key Systems	Total Market
1978	18.7	26.7	20.0	-	21.0
1979	20.1	28.7	26.0	-	22.9
1980	16.7	31.0	27.4	-	21.4
1981	16.2	32.4	26.9	-	20.2
1982	10.2	37.1	16.8	23.1	18.5

INPUT

NOTES:

MPRE-13A

**PERCENT GROWTH BY
DELIVERY MODES
1978-1986 (Cont.)**

YEAR	Proc./ Network Services	Software Prod.	Prof. Services	Turn- key Systems	Total Market
1983	12.9	35.1	21.4	27.9	21.7
1984	16.1	33.3	20.2	30.0	23.2
1985	10.1	18.9	19.8	11.4	14.7
1986	14.2	23.1	15.8	10.9	16.4

Source: INPUT Research and Reports, 1978-1987

INPUT

NOTES:

MPRE-13B

INPUT

U.S. GNP AND OTHER INDICES

(Percent Change)

YEAR	GNP Current Dollars	PPI Finished Goods	CPI All Items	GNP Price Deflator	"Real Growth" GNP-PD
1976	11.5	4.4	5.8	6.4	5.1
1977	11.7	6.5	6.5	6.7	4.0
1978	13.0	7.8	7.7	7.3	5.7
1979	11.5	11.1	11.3	8.9	2.6
1980	8.9	13.5	13.5	9.0	-0.1

INPUT

NOTES:

MPRE-14A

INPUT

U.S. GNP AND OTHER INDICES

(Percent Change) (Cont.)

YEAR	GNP Current Dollars	PPI Finished Goods	CPI All Items	GNP Price Deflator	"Real Growth" GNP-PD
1981	11.7	9.2	10.4	9.7	2.0
1982	3.7	4.0	6.1	6.4	-2.7
1983	7.6	1.6	3.2	3.9	3.7
1984	10.5	2.1	4.3	3.8	6.7
1985	6.6	0.9	3.6	3.3	2.9

INPUT

NOTES:

MPRE-14B

INPUT

U.S. GNP AND OTHER INDICES

(Percent Change) (Cont.)

YEAR	GNP Current Dollars	PPI Finished Goods	CPI All Items	GNP Price Deflator	"Real Growth" GNP-PD
1986	5.2	-1.4	1.0-1.9	2.6	2.6
1987	6.1*	2-3 ***	3.6 *	3.3 *	2.8*
1988	7.5**	-	4.1**	4.1**	3.4**

* Estimate-Dept. of Commerce

** Estimate-Council of Economic Advisors, 8/87

*** Estimate-Bureau of Labor Statistics

Source: U.S. Dept. of Commerce

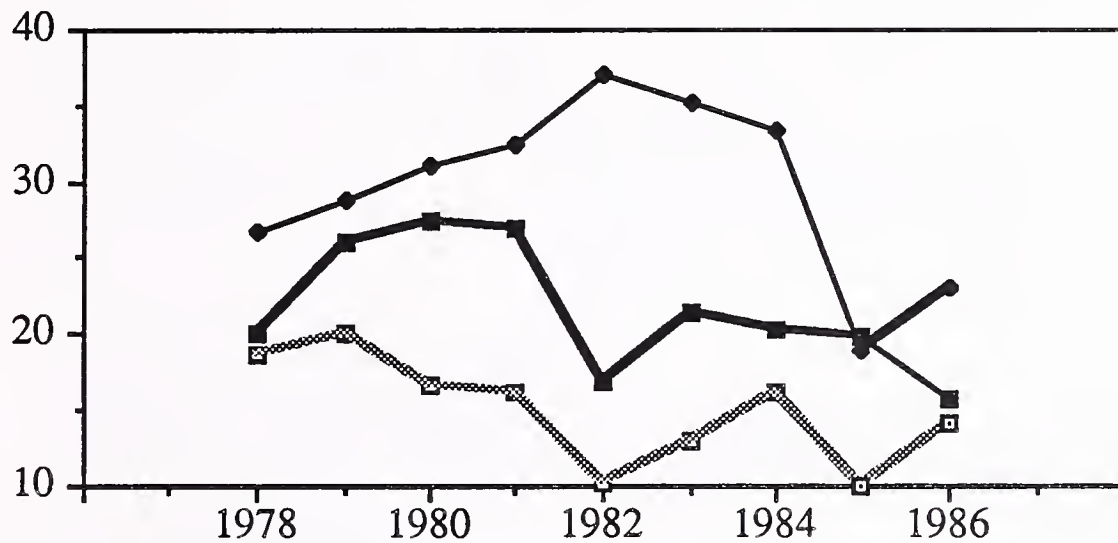
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NOTES:

MPRE-14C

INPUT

PERCENT GROWTH BY DELIVERY MODES 1978 - 1986



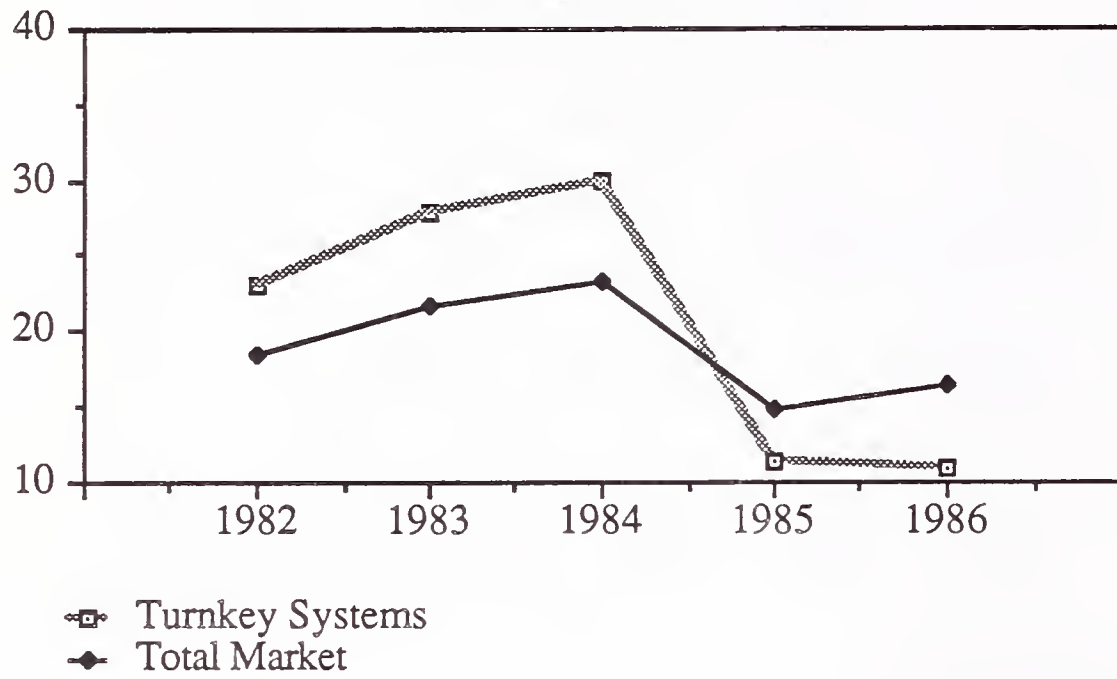
- Proc./Network Services
- ◆ Software Prod.
- Prof. Services

INPUT

NOTES:

MPRE-13a

PERCENT GROWTH BY DELIVERY MODES 1982 - 1986

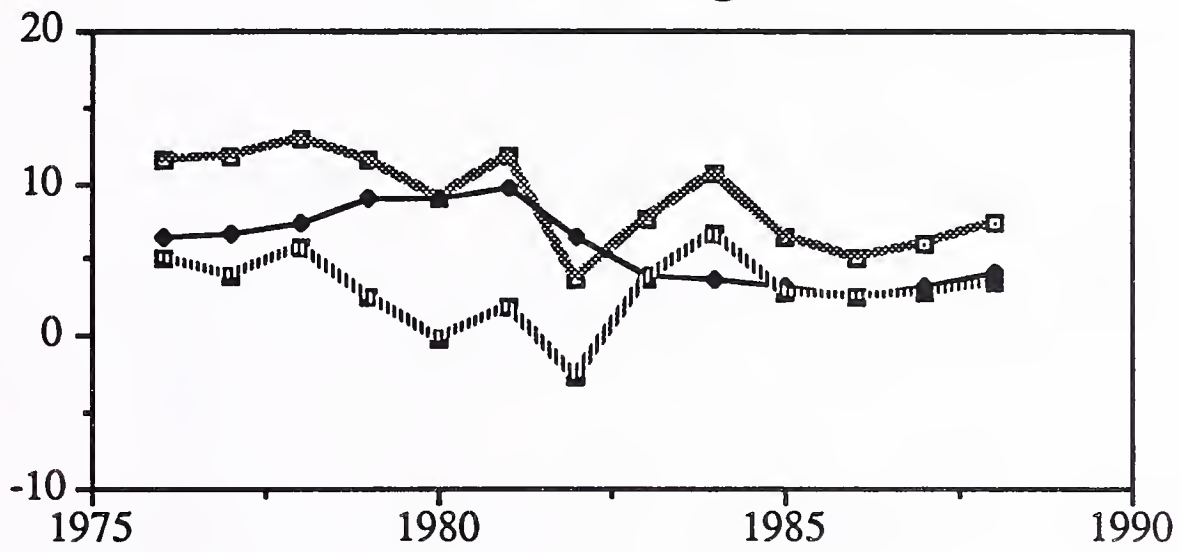


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NOTES:

MPRE-13b

U.S. GNP AND OTHER INDICES (Percent Change)



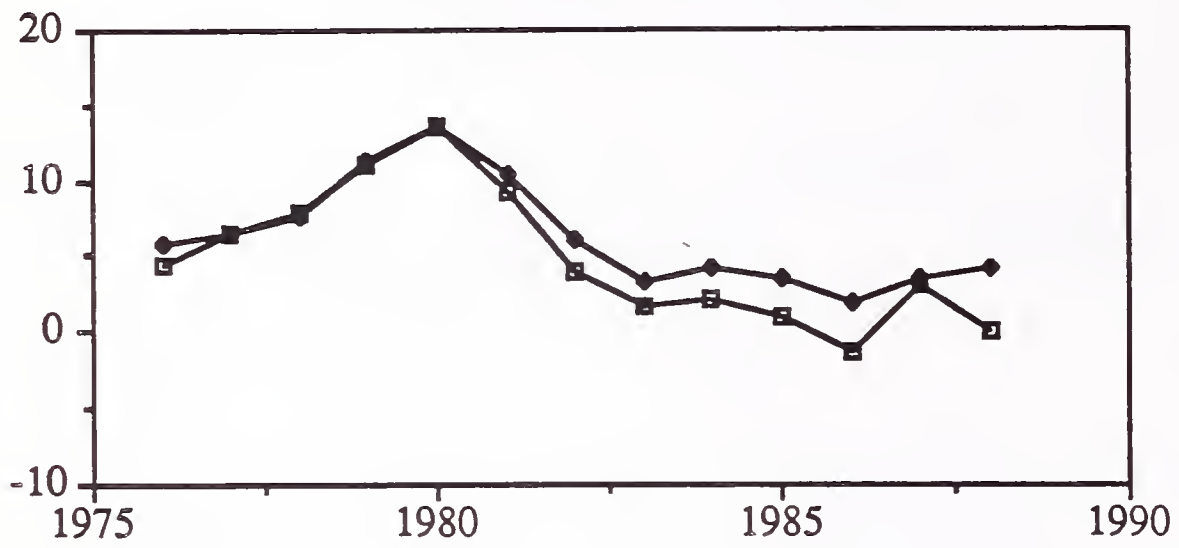
- ◆ GNP Current Dollars
- ◆ GNP Price Deflator
- ◆ "Real Growth" GNP-PD

INPUT

NOTES:

MPRE-14a

U.S. GNP AND OTHER INDICES (Percent Change - Cont.)



□ PPI Finished Goods
◆ CPI All Items

INPUT

NOTES:

MPRE-14b

REAL GROWTH BY DELIVERY MODE 1977-1986

YEAR	'Real Grwth' GNP	Proc./ Network Services		Software Prod.		Prof. Services		Turn-key Systems		Total Market	
		A	B	A	B	A	B	A	B	A	B
1977	4.0	-	-	-	-	-	-	-	-	-	-
1978	5.7	11.4	12.0	19.4	20.0	12.7	13.3	-	-	-	-
1979	2.6	11.2	12.8	19.8	21.4	17.1	18.7	-	-	-	-
1980	-0.1	7.7	7.8	22.0	22.1	18.4	18.5	-	-	-	-

INPUT

NOTES:

MPRE-15A

INPUT

REAL GROWTH BY DELIVERY MODE 1977-1986 (Cont.)

YEAR	'Real Grwth' GNP	Proc./ Network Services		Software Prod.		Prof. Services		Turn-key Systems		Total Market	
		A	B	A	B	A	B	A	B	A	B
1981	2.0	6.5	7.2	22.7	23.4	17.2	17.9	-	-	-	-
1982	-2.7	3.8	0.5	30.7	27.4	10.4	9.7	16.7	13.4	12.1	8.8
1983	3.7	9.0	6.5	31.2	28.7	17.5	15.0	24.0	21.5	17.8	15.3
1984	6.7	12.3	12.2	29.5	29.4	16.4	16.3	26.2	26.1	19.4	19.3

INPUT

NOTES:

MPRE-15B

INPUT

REAL GROWTH BY DELIVERY MODE 1977-1986 (Cont.)

YEAR	'Real Grwth' GNP	Proc./ Network Services		Software Prod.		Prof. Services		Turn-key Systems		Total Market	
		A	B	A	B	A	B	A	B	A	B
1985	2.9	6.8	6.3	15.6	15.1	16.5	16.0	8.1	7.6	11.4	10.9
1986	2.6	11.6	10.9	20.5	19.8	13.2	12.5	8.3	7.6	13.8	13.1

For Each Delivery Mode:

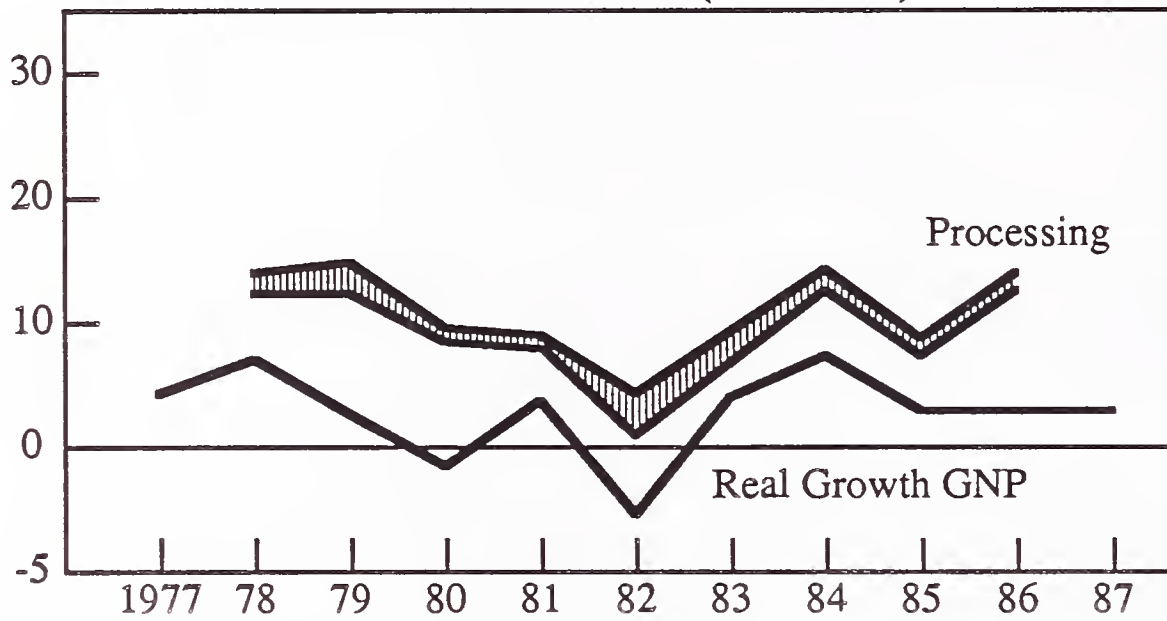
Column A is the Percent Growth Minus That Year's
GNP Price Deflator

Column B is the Percent Growth Minus Previous Year's
GNP Price Deflator

INPUT

NOTES:

REAL GROWTH (Percent)



Note: Values for 1980 represent the growth from 1979 to 1980;
1984 represents growth from 1983 to 1984, etc.

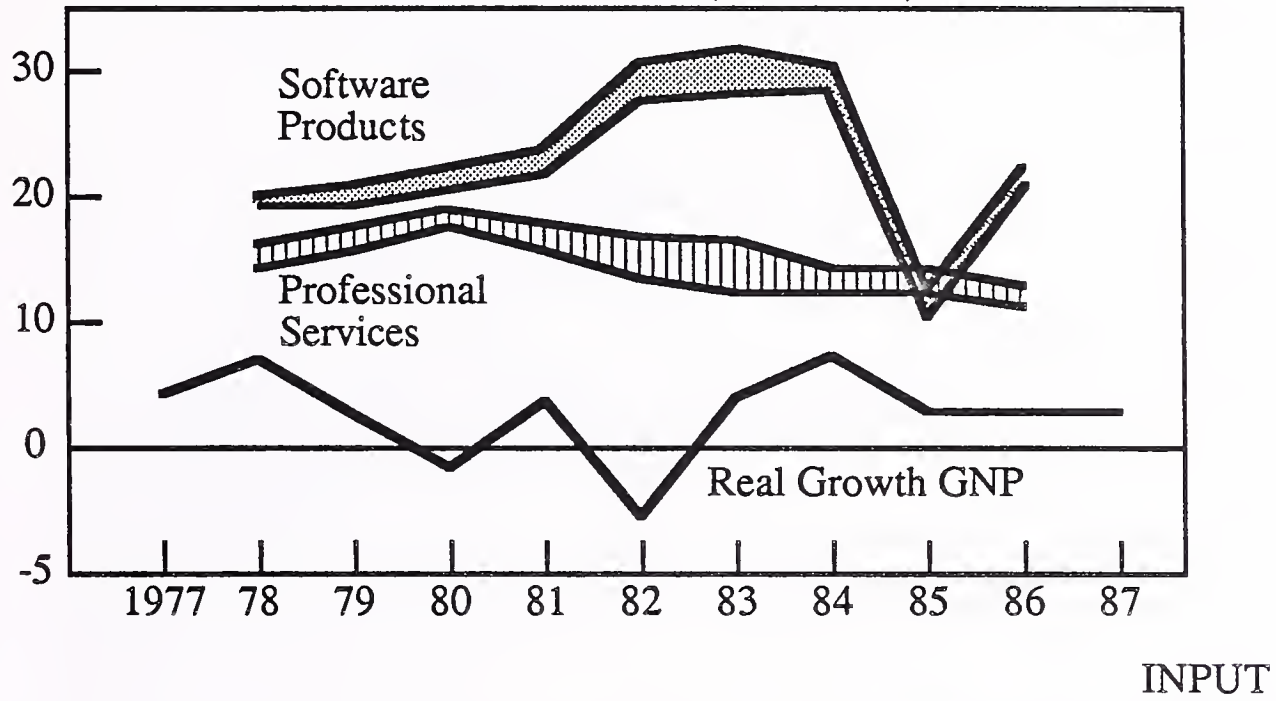
INPUT

NOTES:

MPRE-16A

INPUT

REAL GROWTH (Percent)

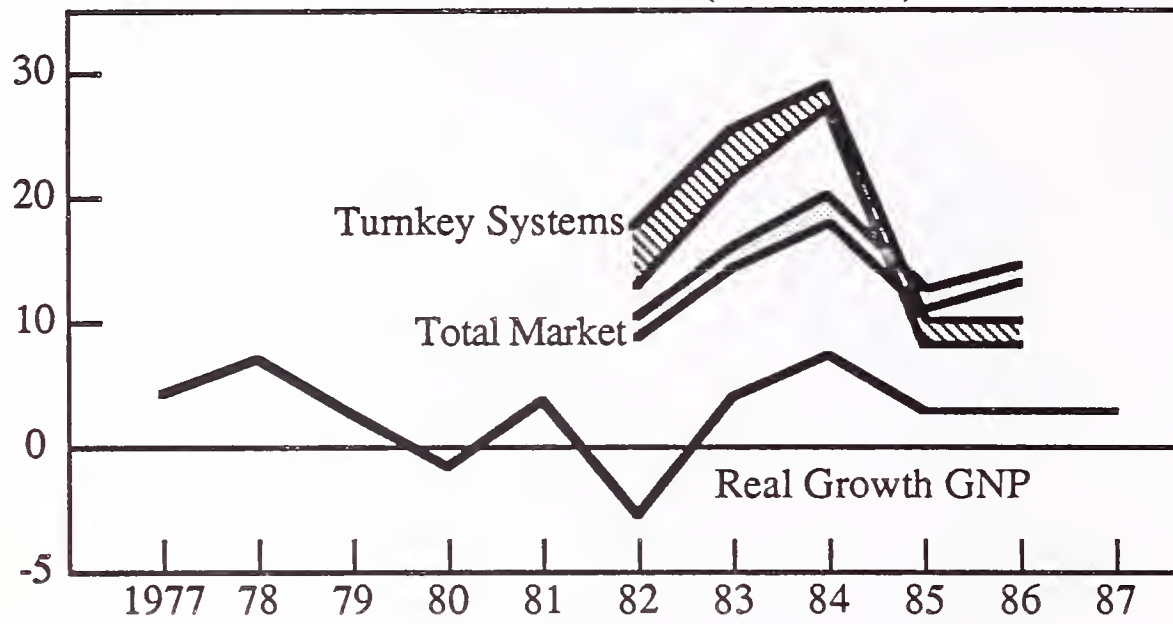


NOTES:

MPRE-16B

INPUT

REAL GROWTH (Percent)



INPUT

NOTES:

MPRE-16C

INPUT

IS MANAGER COMMENTS ON
ECONOMIC CHANGE
(25 INTERVIEWS)

SERVICE INDUSTRY PARTICIPANT
(Constantly Monitoring Economic Indicators)

"Saw Early Signs of Recession in Late 1988,
Early 1989 and Planning For It" ... "Just
Watching to See if Stock Market Acts
as Catalyst"

INPUT

NOTES:

MPRE-17A

INPUT

IS MANAGER COMMENTS ON
ECONOMIC CHANGE (Cont.)
(25 INTERVIEWS)

PROCESS MANUFACTURING PARTICIPANT

"Recession is Already Built into the Plan"
Re: Inflation "Don't See it Coming"

INPUT

NOTES:

MPRE-17B

INPUT

IS MANAGER COMMENTS ON
ECONOMIC CHANGE (Cont.)
(25 INTERVIEWS)

PROCESS MANUFACTURING PARTICIPANT

"My Business Line is Pharmaceuticals Which
are Terribly Immune to Recession",
"Regulatory Considerations are main
Budgetary Impact"

INPUT

NOTES:

MPRE-17C

IS MANAGER COMMENTS ON
ECONOMIC CHANGE (Cont.)
(25 INTERVIEWS)

COUPLE OF OIL COMPANIES

Main Concern is Price of Oil

DISCRETE MANUFACTURER

"Recession is Bound to Come", "Not Sure
Stock Market Crash will Accelerate It",
"Do Not Forsee Inflation"

INPUT

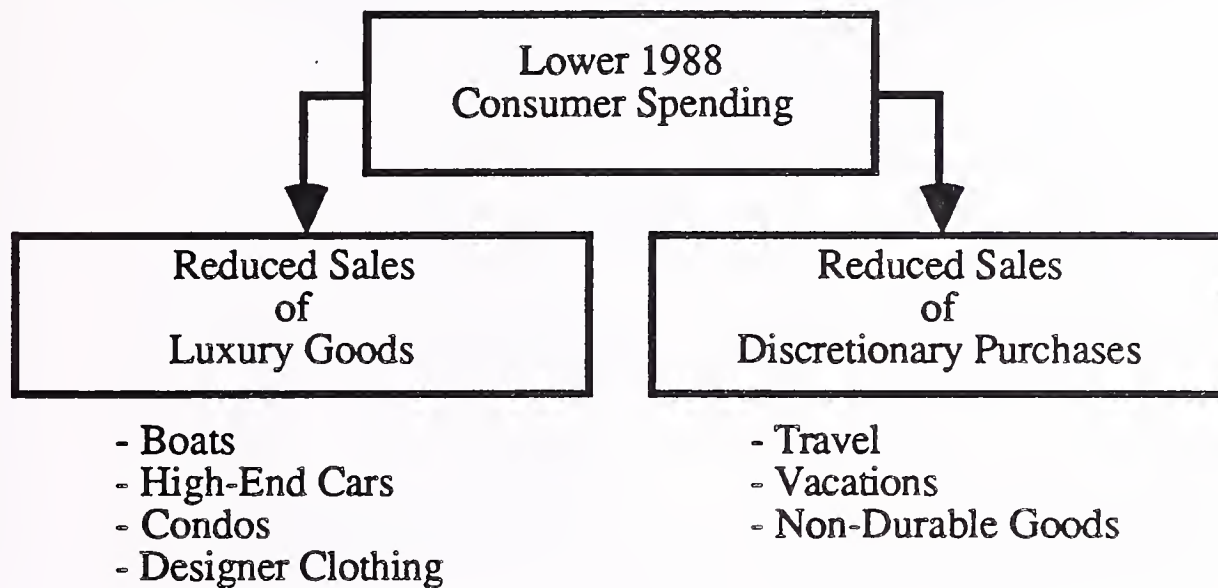
NOTES:

MPRE-17D

INPUT

WHAT IF???

SLOWDOWN: SPENDING PATTERNS



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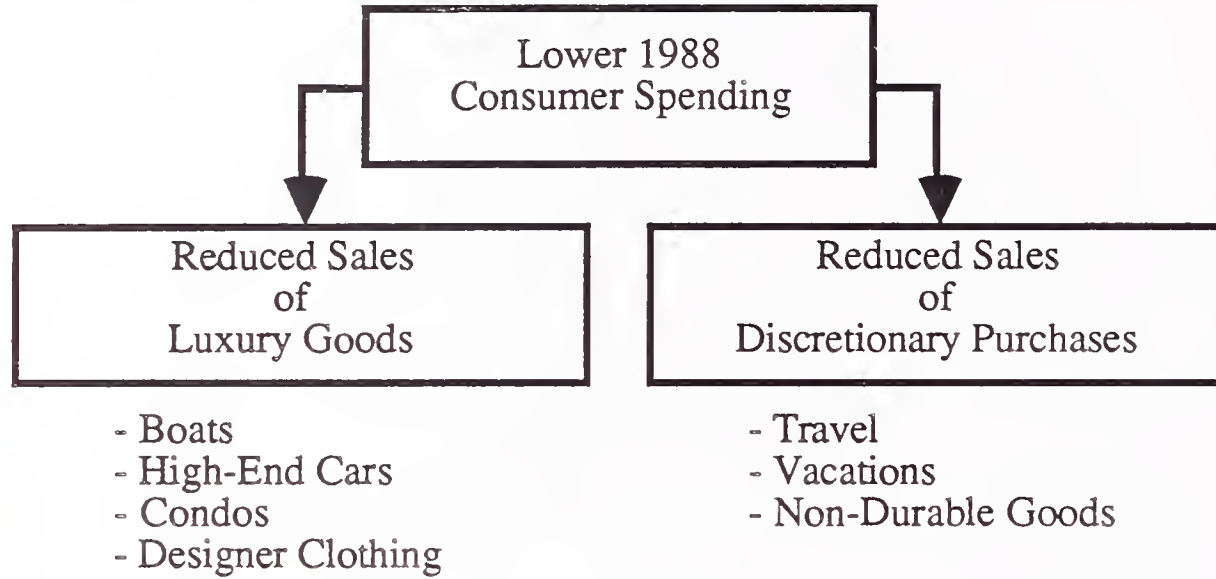
NOTES:

MPRE-18

INPUT

WHAT IF???

SLOWDOWN: SPENDING PATTERNS



INPUT

NOTES:

MPRE-18

WHAT IF???

CONSUMER SPENDING
SLOWDOWN SCENARIO

INDUSTRY SECTOR IMPACT

UNAFFECTED

- Utilities
- Telecommunications
- Insurance
- Medical

INPUT

NOTES:

MPRE-19A

INPUT

WHAT IF???

CONSUMER SPENDING
SLOWDOWN SCENARIO (Cont.)

INDUSTRY SECTOR IMPACT

IMPACTED

- Discrete Manufacturing
- Process Manufacturing
- Transportation
- Distribution
 - Retail
 - Wholesale

INPUT

NOTES:

MPRE-19B

INPUT

WHAT IF???

CONSUMER SPENDING
SLOWDOWN SCENARIO (Cont.)

INDUSTRY SECTOR IMPACT

IMPACTED

- Banking and Finance
- Education
- Services
- Federal Government
- State & Local Government
- "Other"

INPUT

NOTES:

MPRE-19C

INPUT

STOCK MARKET VOLATILITY

SUMMARY: INPUT Predicts
Negligible Change (if any) in
1988 Information Services Industry
Forecast due to Stock Market decline

INPUT

NOTES:

MPRE-20

INPUT

CONNECTIVITY

INPUT

NOTES:

MPRE-21

OBJECTIVES OF CONNECTIVITY

- Platform Integration
- Physical Linkage to Move Information

INPUT

NOTES:

MPRE-22

IBM AND DEC:
ANALYSIS
AND
OPPORTUNITIES

INPUT

NOTES:

MPRE-23

INPUT

IBM VERSUS DEC

- Impact on Services
- Opportunities
- Third Party Roles

INPUT

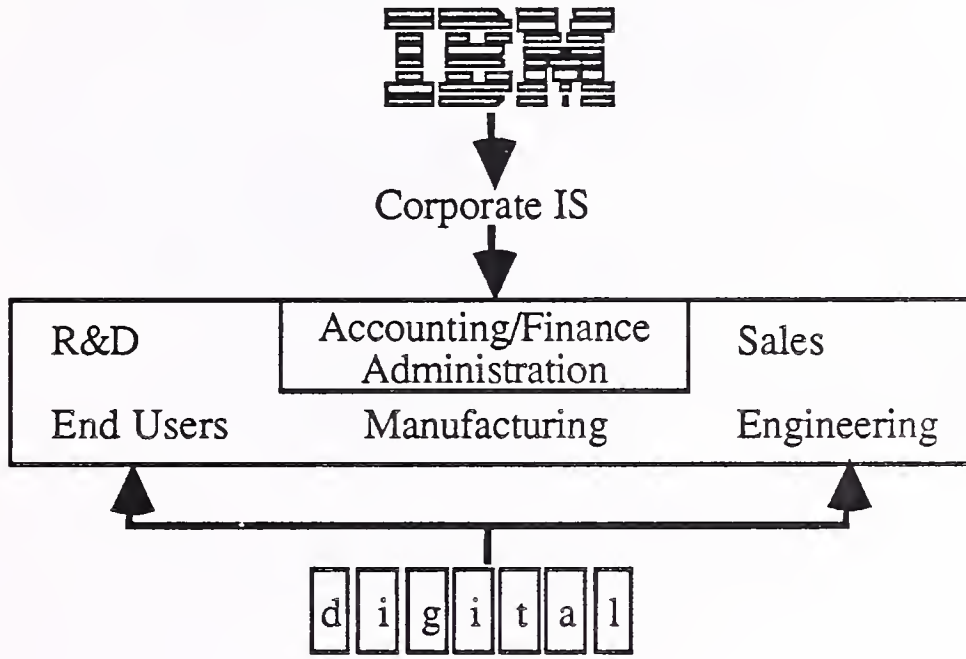
NOTES:

MPRE-24

INPUT

HISTORICAL PERSPECTIVE
HITTING THE MARKET FROM TWO DIRECTIONS

A
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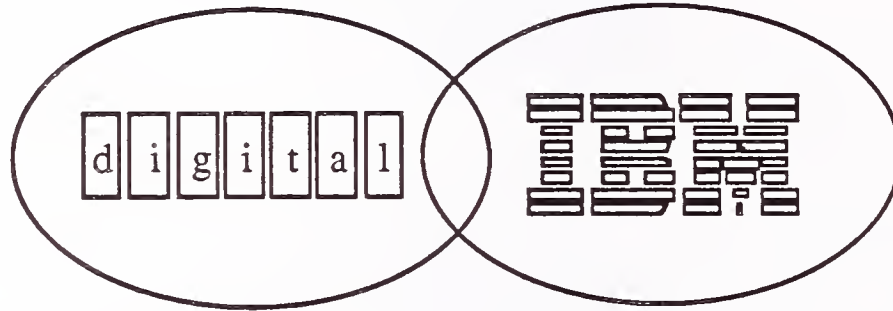
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NOTES:

MPRE-25

INPUT'S VIEWS

(Continued)



THEIR STRATEGIES WILL MOVE THEM CLOSER

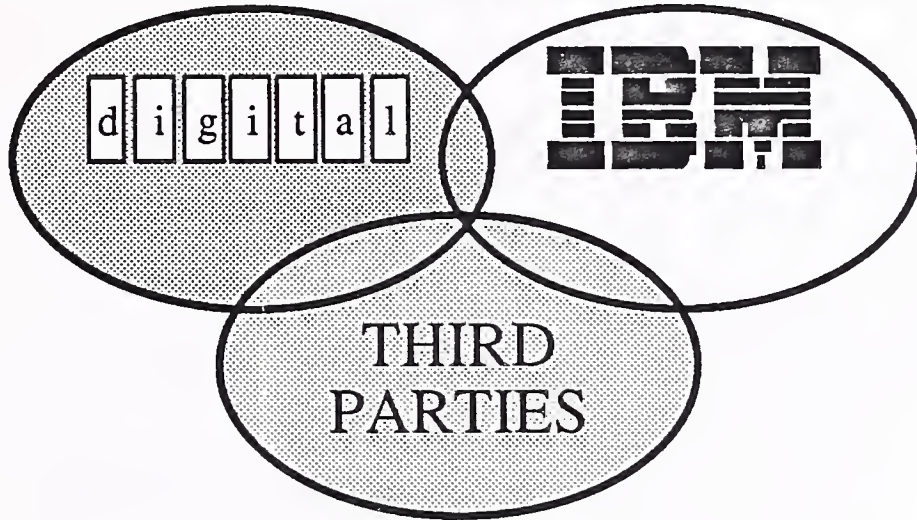
- Processing Capability
- Connectivity
- Software & Service Offerings

INPUT

NOTES:

MPRE-26

THE ROLE OF THIRD PARTIES



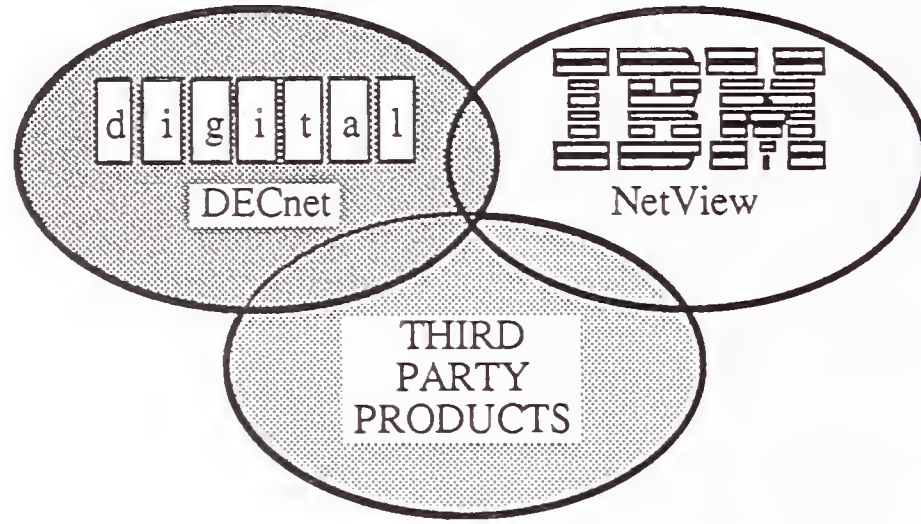
- Connectivity Capabilities
- Applications Software
- Data Base Management Systems

INPUT

NOTES:

MPRE-27

NETWORK MANAGEMENT CONNECTIVITY



INPUT

NOTES:

MPRE-28

THE IMPACT OF THIRD PARTIES

- What IBM & DEC Don't Do, Third Parties Will
- The Three Biggest Areas in Software:
 - Connectivity Software
 - Applications Software
 - Fourth Generation Languages, Data Base and Distributed DB Systems
- Significant Products Are Available for DEC & IBM

INPUT

NOTES:

MPRE-29

KEY PRODUCTS AND ARCHITECTURES

IBM	9370, 3090/Summit, PS/2, Silverlake Systems Applications Architecture Systems Network Architecture
DEC	VAX/VMS Product Line DECNET Network Management

INPUT

NOTES:

MPRE-30

KEY FUTURE BUSINESS STRATEGIES

IBM	Focus on Product Integration Open Communications Cooperative Development
DEC	Continue Unified Product Architecture Upward Expansion of VAX/VMS Re-entry into Micro
BOTH	Software and Services Systems Integration Services

INPUT

NOTES:

MPRE-31

IBM REVENUE GROWTH

SOURCE	(Percent)				
	1983	1984	1985	1986	1987
Sales	38.4	27.8	15.6	(0.6)	5.8
Services	19.4	25.1	20.1	28.0	14.3
Rentals	(17.0)	(28.7)	(37.4)	(25.5)	(20.7)
Total Revenue	16.9	14.3	9.0	2.4	5.8

Net of Currency Gains for 1987: (1.0)

INPUT

NOTES:

MPRE-32

IBM GROSS PROFIT GROWTH

SOURCE	(Percent)				
	1983	1984	1985	1986	1987
Sales	33.5	28.5	12.2	(7.3)	5.2
→ Services	23.3	26.1	30.2	28.7	9.3
Rentals	(15.0)	(28.1)	(40.3)	(29.1)	(31.0)
Gross Profit	15.0	13.6	7.2	(1.4)	3.7

Net of Currency Gains for 1987: 1.6

INPUT

NOTES:

MPRE-33

STANDARDS
IMPACT

INPUT

NOTES:

MPRE-34

IBM STANDARDS - CONTROLLING THE ENVIRONMENT

- WINDOWS: Common Menus, Icons
- SQL: User Query
- SNA: Intercompany Communication

INPUT

NOTES:

MPRE-35

IBM STANDARDS - CONTROLLING THE ENVIRONMENT (Continued)

- Token Ring LAN: Intra-Company Communications
- OSI: Network Design Normalization
- SAA: Application Design and User Interfaces: Bringing It All Together

INPUT

NOTES:

MPRE-36

FORECAST PARAMETERS

- Current Dollars
- User Expenditures - U.S. Only
- Negligible Impact of Stock Market Crash

INPUT

NOTES:

MPRE-38

INPUT'S INFLATION AND GNP ASSUMPTIONS

YEAR	Nominal GNP (Percent)	1987 Report GNP Deflation (Inflation Rate)	Real GNP (Percent)	1986 MAPS Report GNP Deflator
1987	6.1	3.3	2.8	5.0
1988	7.5	4.1	3.4	6.0
1989	6.9	3.0	3.8	6.0

INPUT

NOTES:

MPRE-39A

INPUT

INPUT'S INFLATION AND GNP ASSUMPTIONS (Cont.)

YEAR	Nominal GNP (Percent)	1987 Report GNP Deflation (Inflation Rate)	Real GNP (Percent)	1986 MAPS Report GNP Deflator
1990	6.6	3.0	3.6	6.0
1991	5.5	2.0	3.5	6.0
1992	5.4	2.0	3.4	-

Source: U.S. Dept. of Commerce
Council of Economic Advisors

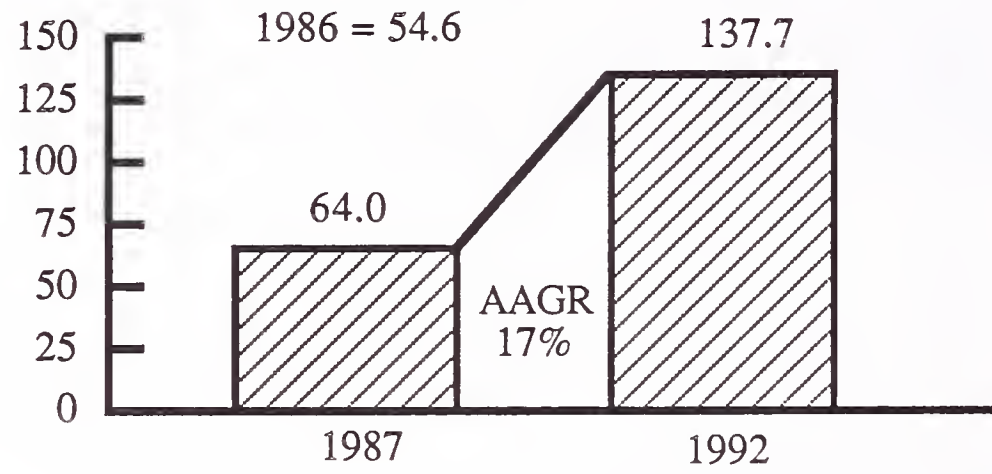
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NOTES:

MPRE-39B

INPUT

INFORMATION SERVICES MARKET (\$ Billions)



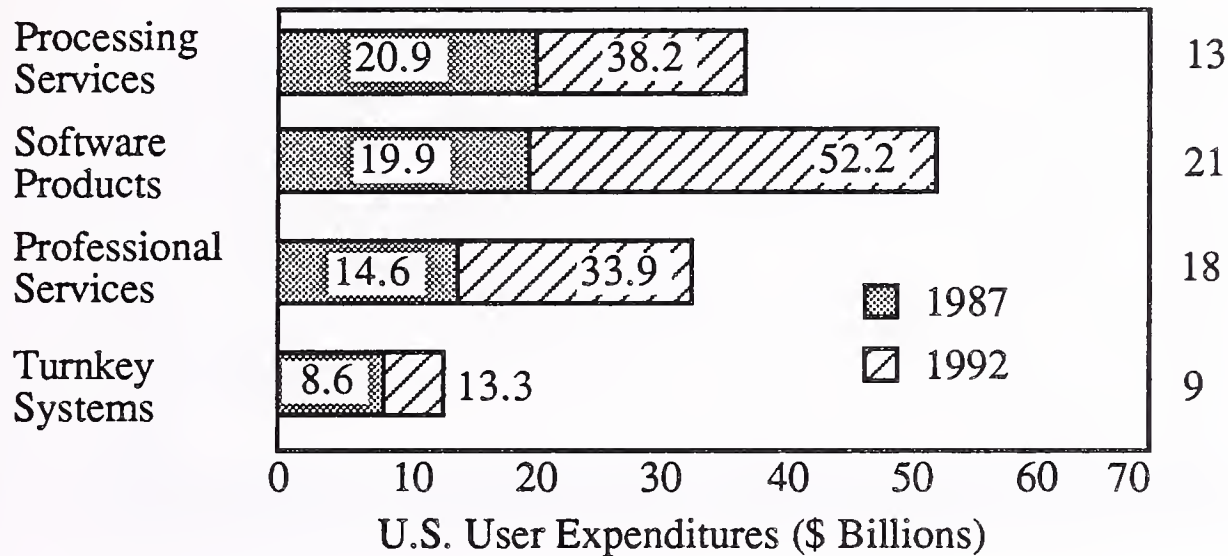
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NOTES:

MPRE-40

INFORMATION SERVICES INDUSTRY BY DELIVERY MODE

AAGR
(Percent)



INPUT

NOTES:

MPRE-41

"HOT" VERTICALS BY AAGR: USER EXPENDITURES

MARKET	\$ BILLIONS			AAGR (PERCENT)
	1986	1987	1992	
Telecommunications	0.7	0.9	2.0	19
Transportation	0.5	0.6	1.4	17
State and Local Gov't	0.6	0.8	1.6	15

INPUT

NOTES:

MPRE-42

**"HOT" VERTICALS BY SIZE:
USER EXPENDITURES**

MARKET	\$ BILLIONS			AAGR (PERCENT)
	1986	1987	1992	
Banking/Finance	5.6	6.5	13.1	15
Discrete Manufacturing	3.3	3.8	6.9	13
Medical	2.1	2.5	5.1	15

INPUT

NOTES:

MPRE-43

BANKING
AND
FINANCE

INPUT

NOTES:

MPRE-44

INPU

BANKING AND FINANCE DRIVING FORCES

- Loan Portfolio Risk
- Cost Reduction
- Merger and Acquisition
- Product Opportunities
- Use of Technology/Conversion from Paper
- Deregulation

INPUT

NOTES:

MPRE-45

INPUT

BANKING AND FINANCE ISSUES

- New Services or Product Requirements,
Particularly for New Revenue Opportunities
Cannot Be Met Rapidly Enough.
- Need for an Integrated Information
Architecture.

INPUT

NOTES:

MPRE-46A

INPUT

BANKING AND FINANCE ISSUES (Cont.)

- Growing Demand for Electronic Information Delivery Systems.
- Merger Acquisition Activity that Favors Consolidation of Data Centers, Software, and IS Staff within Affected Institutions.

INPUT

NOTES:

MPRE-46B

INPUT

BANKING AND FINANCE ISSUES (Cont.)

- The Creation of Overcapacity in a Desire to Upgrade Systems.
- Possible Decrease of Costs through a Shift of Work to External or Shared Processing Facilities.
- Growing Importance of Computer System Security.

INPUT

NOTES:

MPRE-46C

INPUT

BANKING AND FINANCE OBJECTIVES

- Cost Containment.
- Handle Expanding or Changing System Requirements for Products more Rapidly
- Improve Information Delivery within Institutions and to Customers.
- Respond to Regulatory Requirements.

INPUT

NOTES:

MPRE-47

INPUT

BANKING AND FINANCE IMPACT OF TECHNOLOGY

	IMPACT	COMMENTS
End-User Computing	Medium	Growing in Larger Banks.
Departmental Processing	Medium	Applications and OA are now Being Done on Departmental Computing Systems in Large Banks.

INPUT

NOTES:

MPRE-48A

INPU

BANKING AND FINANCE IMPACT OF TECHNOLOGY (Cont.)

	IMPACT	COMMENTS
Connectivity	High	Connectivity Required to Serve Marketing, Contact and Planning Needs.
Relational Data Bases	Low	Larger Banks are Interested.

INPUT

NOTES:

MPRE-48B

INPUT

BANKING AND FINANCE IMPACT OF TECHNOLOGY (Cont.)

	IMPACT	COMMENTS
Voice/Data Integration	Medium	While Viewed as Important, Connectivity Outranks Voice/Data Integration Needs.
LANs	Medium	Usage has Grown.

INPUT

NOTES:

MPRE-48C

INPUT

BANKING AND FINANCE IMPACT OF TECHNOLOGY (Cont.)

	IMPACT	COMMENTS
CD-ROM	Low	Will be Introduced for Storage of Data for Occasional Retrieval.
Use of AI	Low	Will be Introduced in Credit and Investment Evaluation and in ATM Interaction.

INPUT

NOTES:

MPRE-48D

INPUT

BANKING AND FINANCE
AREAS OF
NEW TECHNOLOGY INTEREST

- Connectivity
 - Wide Area Networks
 - Medium Area Networks
 - Control of Shared Data

INPUT

NOTES:

MPRE-49A

INPUT

**BANKING AND FINANCE
AREAS OF
NEW TECHNOLOGY INTEREST (Cont.)**

- End-User Computing
 - Interaction with Corporate Data Base through Microcomputers and Distributed Minicomputers
 - Data Integrity
 - Data Security
 - Utilization of CASE
- Use of AI in Credit, Investment and ATM Interfaces

INPUT

NOTES:

MPRE-49B

INPUT

BANKING AND FINANCE EMPHASIS IN 1987

- International Lending, Foreign Exchange Trading and Foreign Debt Monitoring and Restructuring
- Integrated Retail and Wholesale Deposit System

INPUT

NOTES:

MPRE-50A

INPUT

BANKING AND FINANCE EMPHASIS IN 1987 (Cont.)

- Securities Processing and Analysis for Trading Purposes and Portfolio Management
- Converting Central Files to Data Base Management System
- Electronic Data Interchange and Distribution

INPUT

NOTES:

MPRE-50B

INPUT

DISCRETE
MANUFACTURING

INPUT

NOTES:

MPRE-51

INPU

ISSUES AND IMPLICATIONS

AREA	ISSUE	IMPLICATIONS FOR IS VENDORS
Markets	Declining share of worldwide markets Major deficit in U.S. merchandise trade balance Heavy competition from "lower-cost" foreign firms	Increased interest in improving production efficiencies

INPUT

NOTES:

MPRE-52A

INPUT

ISSUES AND IMPLICATIONS (Cont.)

AREA	ISSUE	IMPLICATIONS FOR IS VENDORS
Markets	Need for company-wide automation strategies	More rapid obsolescence of older automated systems More frequent company-wide systems contracts with vendors Systems integration approach

INPUT

NOTES:

MPRE-52B

INPUT

ISSUES AND IMPLICATIONS (Cont.)

AREA	ISSUE	IMPLICATIONS FOR IS VENDORS
Markets	Need for increased interdepartmental planning and coordination	Need for more education and training services Professional services opportunities

INPUT

NOTES:

MPRE-52C

INPUT

ISSUES AND IMPLICATIONS (Cont.)

AREA	ISSUE	IMPLICATIONS FOR IS VENDORS
Production	Interest in "just-in-time" manufacturing - Reduced inventory - Flexible set-up	Less complex MRP II planning units Relational DBMS and group technology Improved automatic storage and retrieval systems

INPUT

NOTES:

MPRE-53A

INPU

ISSUES AND IMPLICATIONS (Cont.)

AREA	ISSUE	IMPLICATIONS FOR IS VENDORS
Production	- Improved material handling - Instant communication	Physical linkage of shop floor and engineering systems via telecommunications Factory floor LANs+ office LANs

INPUT

NOTES:

MPRE-53B

INPUT

ISSUES AND IMPLICATIONS (Cont.)

AREA	ISSUE	IMPLICATIONS FOR IS VENDORS
Production		Standardization of network protocols (e.g., MAP) Need for electronic information interchanges between suppliers, manufacturers, and dealers

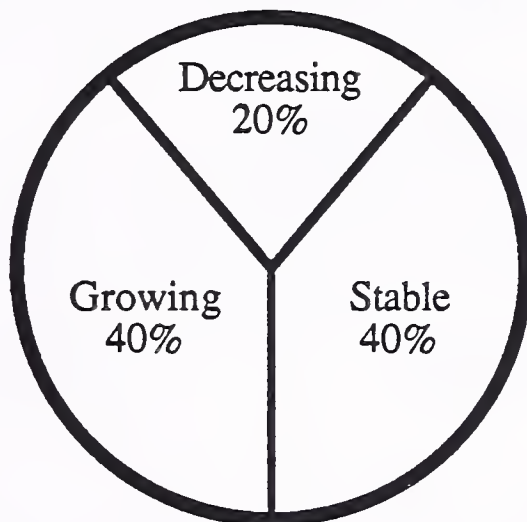
INPUT

NOTES:

MPRE-53C

INPU

DISCRETE MANUFACTURING 1987 BUDGET CHANGES



INPUT

NOTES:

MPRE-54

INPUT

DISCRETE MANUFACTURING OPPORTUNITIES

- Manufacturing Planning and Control Systems (MPCS)
- Continued Penetration of CAD/CAM/CAE
- Shop Floor Control
- MAP II

INPUT

NOTES:

MPRE-56A

INPU

DISCRETE MANUFACTURING OPPORTUNITIES (Cont.)

- Computer-Integrated Manufacturing
 - Group Technology
 - Automated Handling Systems
 - Robotics

INPUT

NOTES:

MPRE-56B

INPUT

MEDICAL

INPUT

NOTES:

MPRE-57

INPU

MEDICAL DRIVING FORCES

- Cost Containment
- Government Regulations
- Changing Reimbursement Mechanisms
- Industry Competition
- Industry Consolidation

INPUT

NOTES:

MPRE-58

INPUT

MEDICAL ISSUES AND OBJECTIVES

OBJECTIVE ISSUE	Cost Contain- ment	Implement On-Line Accounting for Regulatory Reporting	Improve Confidentiality of Patient Information
Cost Pressure	High	NA	Medium
More Complex Accounting Systems	Medium	NA	High

INPUT

NOTES:

MPRE-59A

INPUT

MEDICAL
ISSUES AND OBJECTIVES (Cont.)

OBJECTIVE ISSUE	Cost Contain- ment	Implement On-Line Accounting for Regulatory Reporting	Improve Confidentiality of Patient Information
Centralized Patient Information	Medium	High	Medium
Provide Automated Tools to Assist/ Attract Physicians	NA	Medium	Medium

INPUT

NOTES:

MPRE-59B

INPUT

MEDICAL
ISSUES AND OBJECTIVES (Cont.)

OBJECTIVE ISSUE	Cost Contain- ment	Implement On-Line Accounting for Regulatory Reporting	Improve Confidentiality of Patient Information
Automated Manual Processes to Improve Productivity	Medium	NA	Low
Regulatory Reporting Compliance	Medium	Low	Medium

INPUT

NOTES:

MPRE-59C

INPUT

MEDICAL IMPACT OF TECHNOLOGY (Cont.)

	IMPACT	COMMENTS
Distributed Systems Development	High	Heavy DDP environment with specialized computing needs.
Relational Data Bases	Low	Low activity.

INPUT

NOTES:

MPRE-60B

INPUT

MEDICAL
IMPACT OF TECHNOLOGY (Cont.)

	IMPACT	COMMENTS
Voice/Data Integration	Low	Not an immediate priority.
LANs	Medium/ High	Lack of standards is delaying implementation, but the DDP environment requires a well-planned LAN strategy.

INPUT

NOTES:

MPRE-60C

INPU

MEDICAL
ISSUES AND OBJECTIVES (Cont.)

OBJECTIVE ISSUE	Attract Physicians w/ Technology Innovation	Implement Integrated Patient Care Systems
Cost Pressure	NA	Medium
More Complex Accounting Systems	NA	Medium

INPUT

NOTES:

MPRE-59D

INPUT

MEDICAL
ISSUES AND OBJECTIVES (Cont.)

OBJECTIVE ISSUE	Attract Physicians w/ Technology Innovation	Implement Integrated Patient Care Systems
Centralized Patient Information	Medium	Medium
Provide Automated Tools to Assist/ Attract Physicians	High	Medium

INPUT

NOTES:

MPRE-59E

INPU

MEDICAL
ISSUES AND OBJECTIVES (Cont.)

OBJECTIVE ISSUE	Attract Physicians w/ Technology Innovation	Implement Integrated Patient Care Systems
Automated Manual Processes to Improve Productivity	Low	High
Regulatory Reporting Compliance	Low	Medium

INPUT

NOTES:

MPRE-59F

INPUT

MEDICAL
ISSUES AND OBJECTIVES (Cont.)

OBJECTIVE ISSUE	Support End User Needs	Implement Automated Laboratory Systems
Cost Pressure	NA	Medium
More Complex Accounting Systems	Low	Low

INPUT

NOTES:

MPRE-59G

INPUT

MEDICAL
ISSUES AND OBJECTIVES (Cont.)

OBJECTIVE ISSUE	Support End User Needs	Implement Automated Laboratory Systems
Centralized Patient Information	Medium	Medium
Provide Automated Tools to Assist/ Attract Physicians	Medium	Medium

INPUT

NOTES:

MPRE-59H

INPUT

MEDICAL
ISSUES AND OBJECTIVES (Cont.)

OBJECTIVE ISSUE	Support End User Needs	Implement Automated Laboratory Systems
Automated Manual Processes to Improve Productivity	Medium	High
Regulatory Reporting Compliance	High	Medium

INPUT

NOTES:

MPRE-59I

INPU

MEDICAL IMPACT OF TECHNOLOGY

	IMPACT	COMMENTS
End-User Computing	Low/ Medium	Potential to reduce IS workload. Most just beginning to support end users.
Departmental Processing	Medium/ High	Many departments have their own processors-strategic need to integrate, support, and optimize benefits.

INPUT

NOTES:

MPRE-60A

INPUT

MEDICAL
NEW APPLICATIONS IN 1987

- Accounting/Payment
- Marketing
- Patient Care

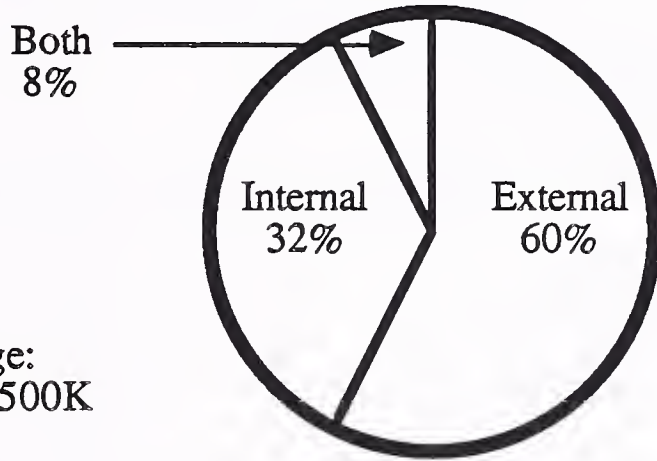
INPUT

NOTES:

MPRE-61A

INPU

MEDICAL NEW APPLICATIONS IN 1987 (Cont.)



Cost Range:
\$20K-\$1,500K

Percent of Responses

INPUT

NOTES:

MPRE-61B

INPUT

MEDICAL INDUSTRY OPPORTUNITIES

- Nursing Scheduling
- Materials Management
- Radiology Inventory Control
- Dietary Systems
- Outpatient Abstracting
- Marketing Information Systems

INPUT

NOTES:

MPRE-62

INPUT

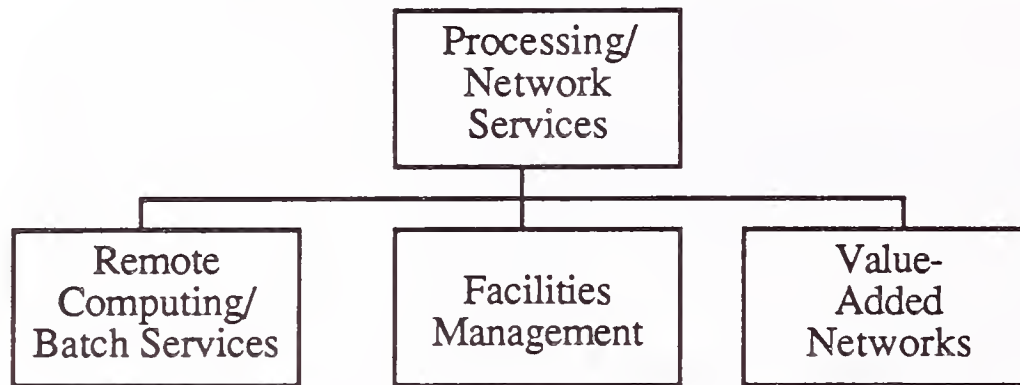
PROCESSING/NETWORK SERVICES

INPUT

NOTES:

MPRE-63

PROCESSING/NETWORK SERVICES MARKET STRUCTURE



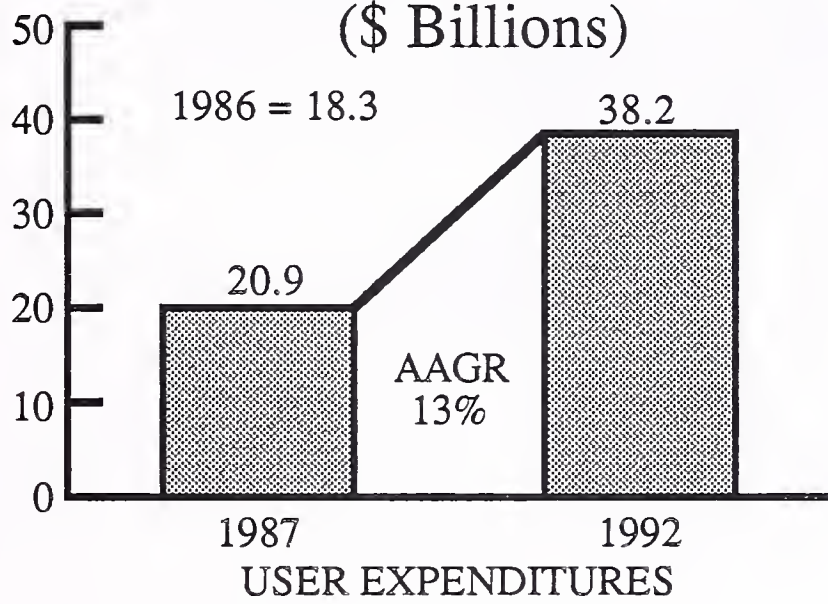
INPUT

NOTES:

MPRE-64

PROCESSING/NETWORK SERVICES MARKET

(\$ Billions)

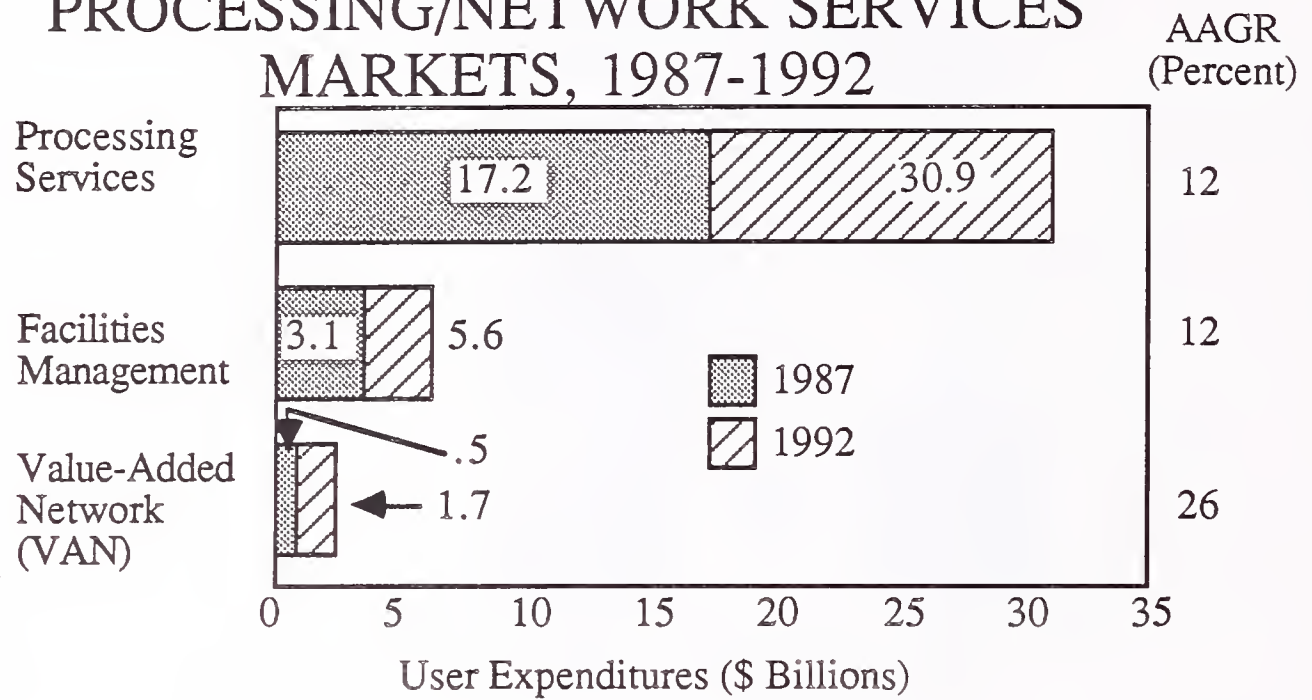


INPUT

NOTES:

MPRE-65

PROCESSING/NETWORK SERVICES MARKETS, 1987-1992

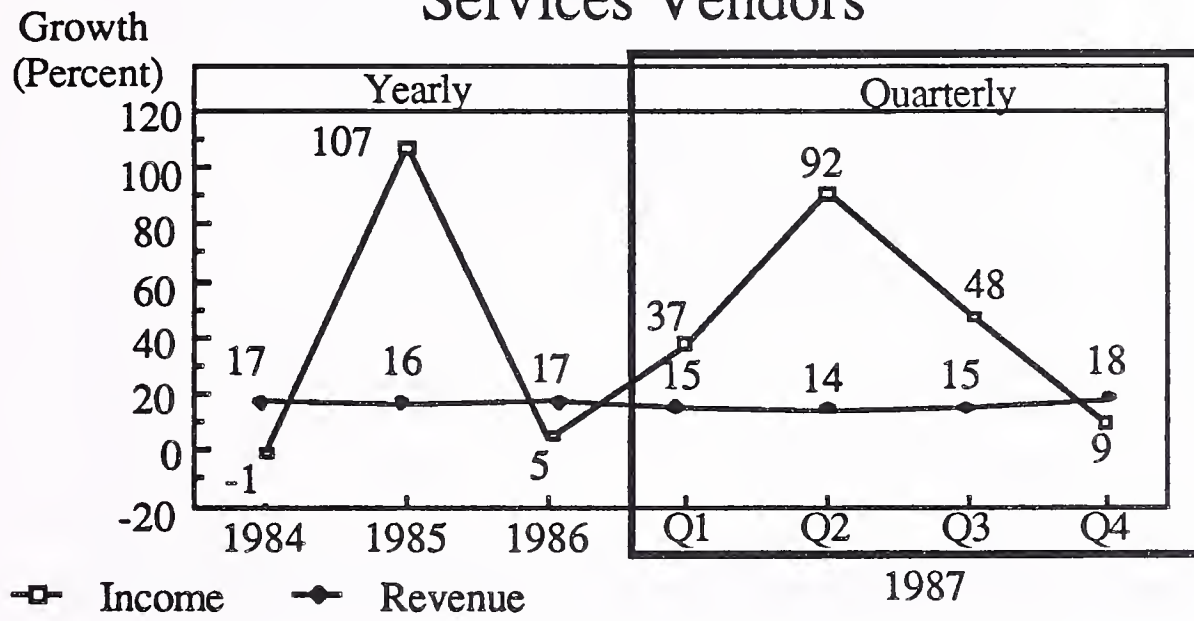


INPUT

NOTES:

MPRE-66

Public Processing/Network Services Vendors



INPUT

NOTES:

MVFW Q4 MPRE-67

PROCESSING/NETWORK SERVICES LARGEST VENDORS - 1986

	<u>Revenue</u> <u>(\$ Millions)</u>
Automatic Data Processing	1,135
Electronic Data Systems	788
Control Data	600
McDonnell Douglas	470
Equifax	302

INPUT

NOTES:

MPRE-68

PROCESSING/NETWORK SERVICES FAST-GROWING VENDORS - 1986

	<u>Revenue (\$ Millions)</u>	<u>85-86 Growth (Percent)</u>
GTECH	75	188
Flserv	63	114
Certified Collateral	14	89
CCX Network	22	67
CUC Int'l	128	62

INPUT

NOTES:

MPRE-69

PROCESSING/NETWORK SERVICES: DRIVING FORCES

- Mature Market
 - Few Competitive Changes
 - Cost of Entry High
 - Steady Growth
- On-Line Data Base Segment Growing
 - CD-ROM Impact

INPUT

NOTES:

MPRE-70

PROCESSING/NETWORK SERVICES: DRIVING FORCES

- Growing Steadily with Network/Transaction Processing Increasing Faster and Batch Growing Slower
- EDI Evolving Quickly
- Major Impact to On-Line Data Base Services Would be FCC (Proposed) Access Charge

INPUT

NOTES:

MPRE-71

EDI
ABOUT TO UNFURL

INPUT

NOTES:

MPRE-72

INPUT

ELECTRONIC DATA INTERCHANGE

The Computer-to Computer Exchange of
Intercompany Business Documents
and Information

- Overcomes Incompatibilities
- Standard Formats

INPUT

NOTES:

MPRE-73

EDI TRANSMITS ELECTRONIC BUSINESS DOCUMENTS

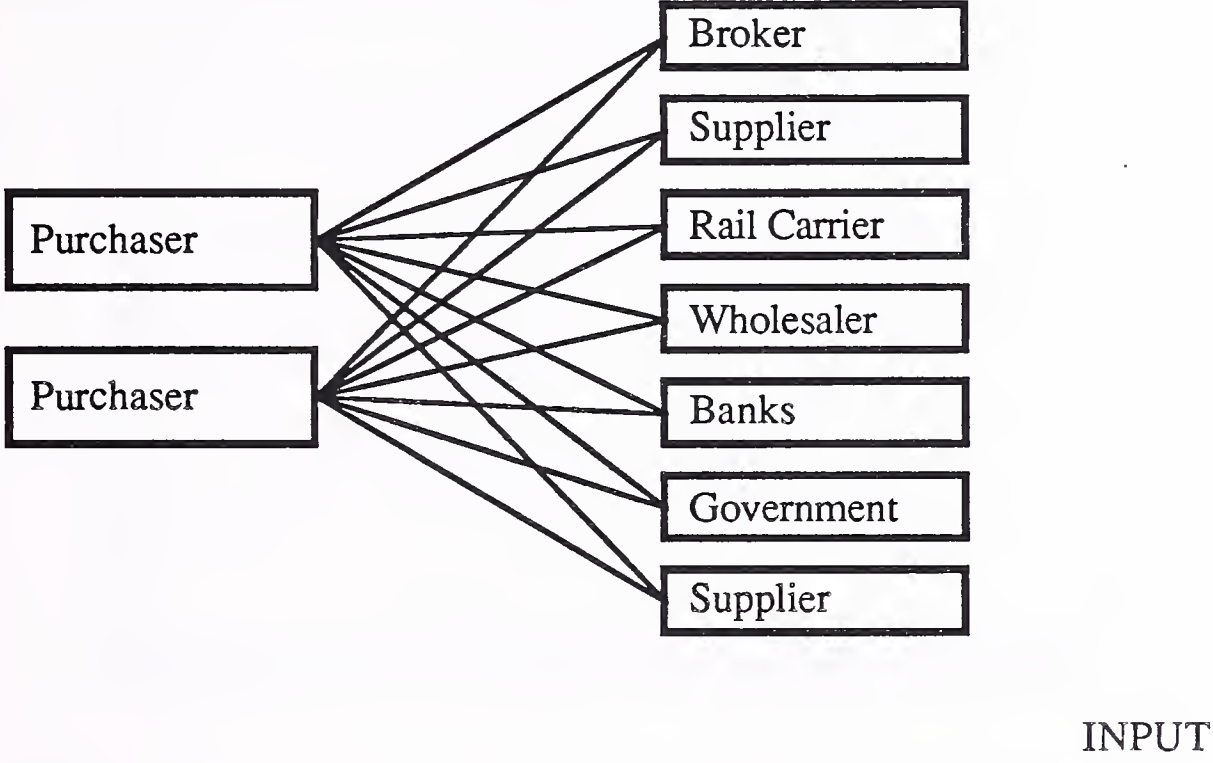
- Machine Readable
- POs, Invoices, etc.
- Also Health Care Claims, Others
- Not ATM, POS, or E-Mail

INPUT

NOTES:

MPRE-74

EDI LINKS CAN GET COMPLICATED



NOTES:

MPRE-76

PRIVATE EDI NETWORKS

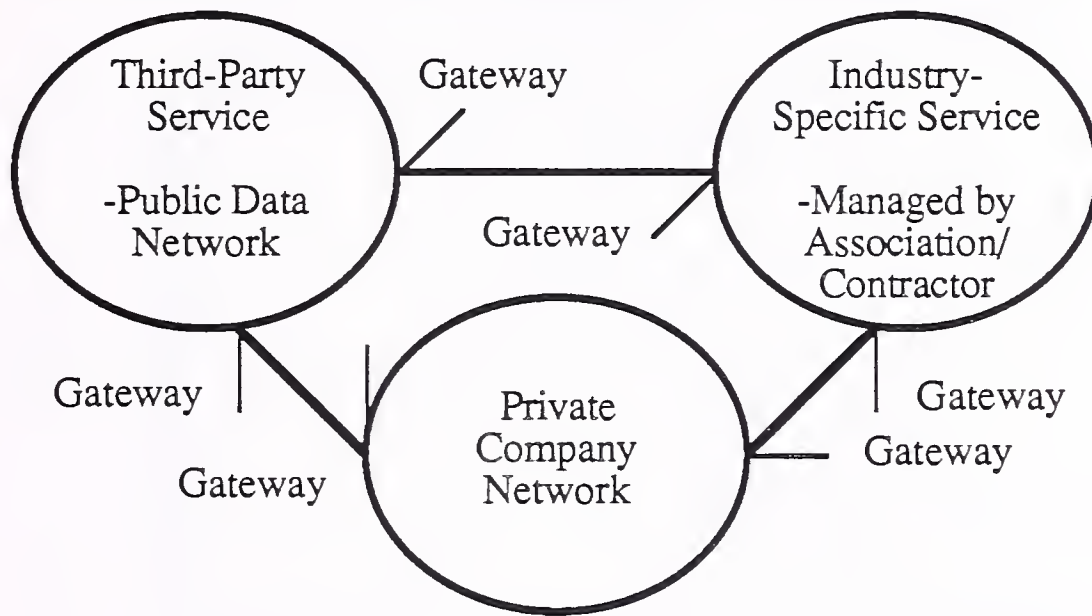
Rockwell	Auto Makers
Caterpillar	Hewlett-Packard
Sears/Penneys	American Hospital Supply
General Foods	Levi-Straus
Motorola	Others

INPUT

NOTES:

MPRE-77

THREE TYPES OF EDI NETWORKS



INPUT

NOTES:

MPRE-78

EDI SERVICE COMPONENTS/PROFITABILITY

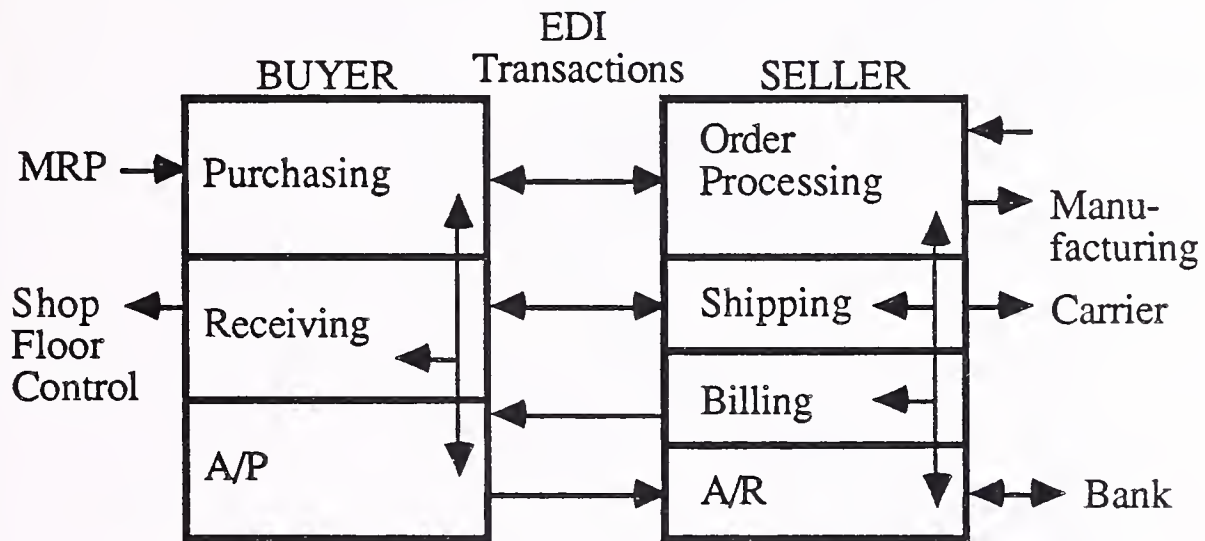
- Communications - Low
- Processing - Medium
- "Value Added" - High
 - Reports
 - Data Base
 - Graphics
 - Etc.

INPUT

NOTES:

MPRE-79

EDI/APPLICATION INTEGRATION

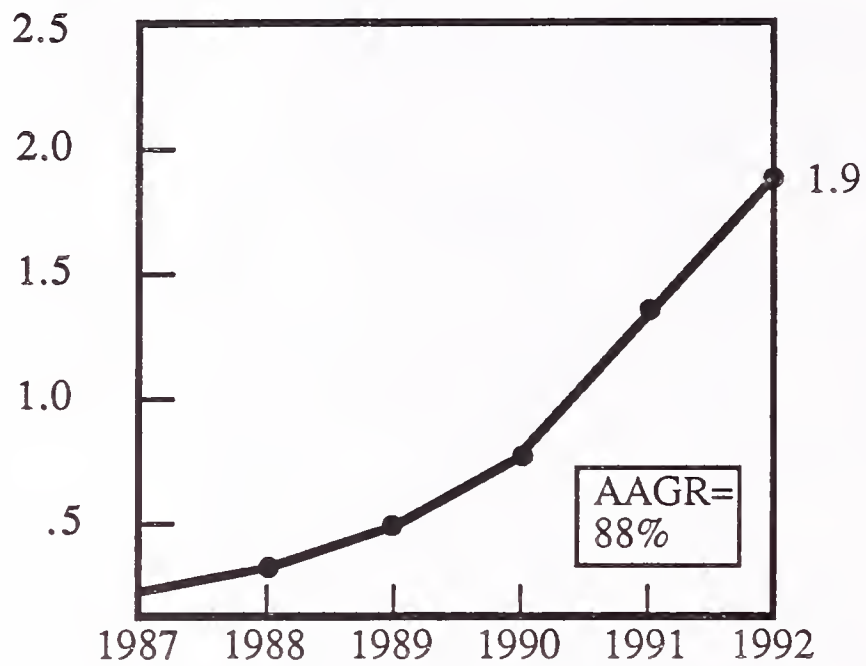


INPUT

NOTES:

MPRE-80

EDI MARKET FORECAST*



1986 Market: \$46 Million

INPUT

*Network/Processing Services, Software, Professional Services

NOTES:

MPRE-81

ONLINE
DATABASES

INPUT

NOTES:

MPRE-82

INPUT

ONLINE DATABASE INDUSTRY SUMMARY STATUS-1987

- Two Million Customers
- 3,350 Databases
- Two Billion Records
- 1,500 Publishers
- 500 Online Vendors

INPUT

NOTES:

MPRE-83

INPUT

FULL RANGE OF SERVICES

ELECTRONIC INFORMATION SERVICES

- Online Databases
- Bulletin Boards
- Optical Media
- VANs
- Videotex

INPUT

NOTES:

MPRE-84

INPUT

MAJOR EIS PARTICIPANTS

- Information Providers
- Systems Vendors
- Infrastructure Companies
- Commercial Services Sponsors

INPUT

NOTES:

MPRE-85

INPUT

ONLINE DATABASE MARKET FACTORS

- Market Complexion Changing
- Grass Roots Usage
- Commodity Orientation
- Regulatory Issues
- "Local" Media
- Innovations Still Possible

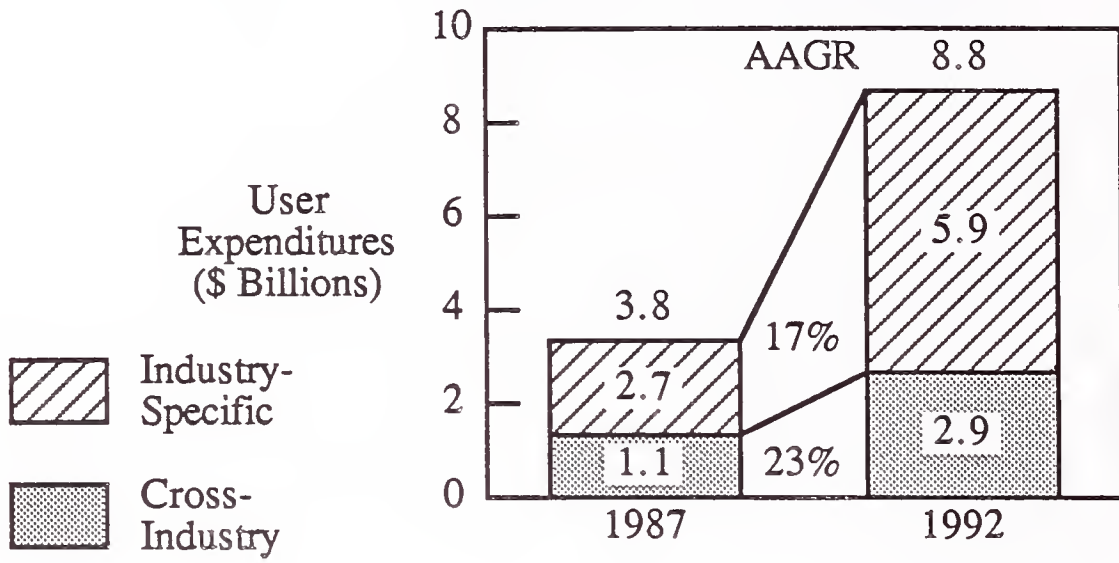
INPUT

NOTES:

MPRE-86

INPUT

ONLINE DATABASE MARKET SIZE 1987-1992



INPUT

NOTES:

MPRE-87

INPUT

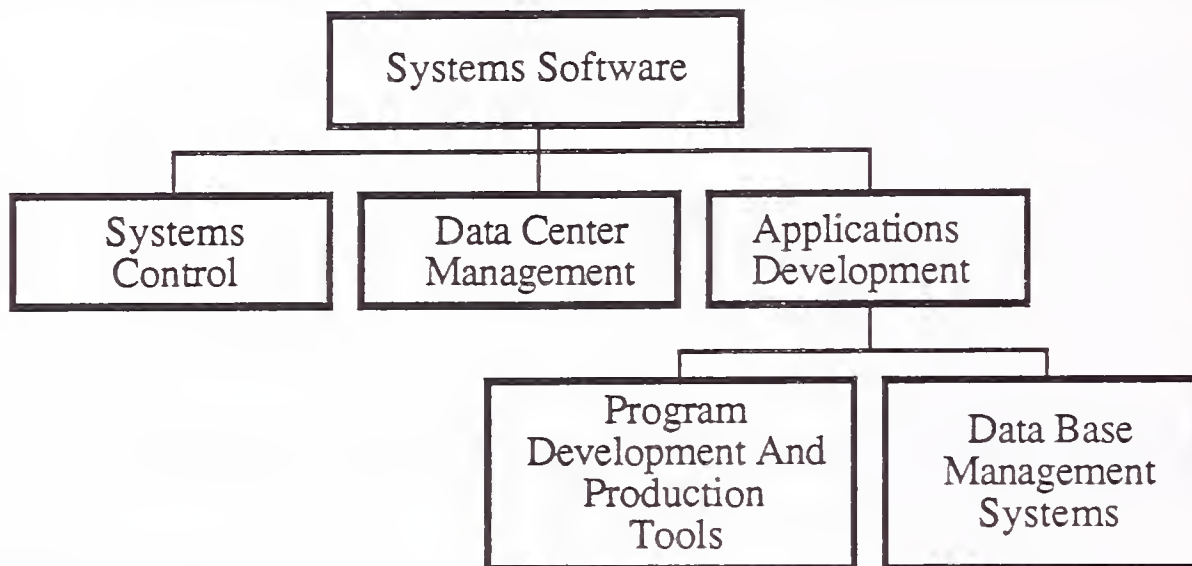
SOFTWARE PRODUCTS

INPUT

NOTES:

MPRE-88

SYSTEMS SOFTWARE MARKET SEGMENTS

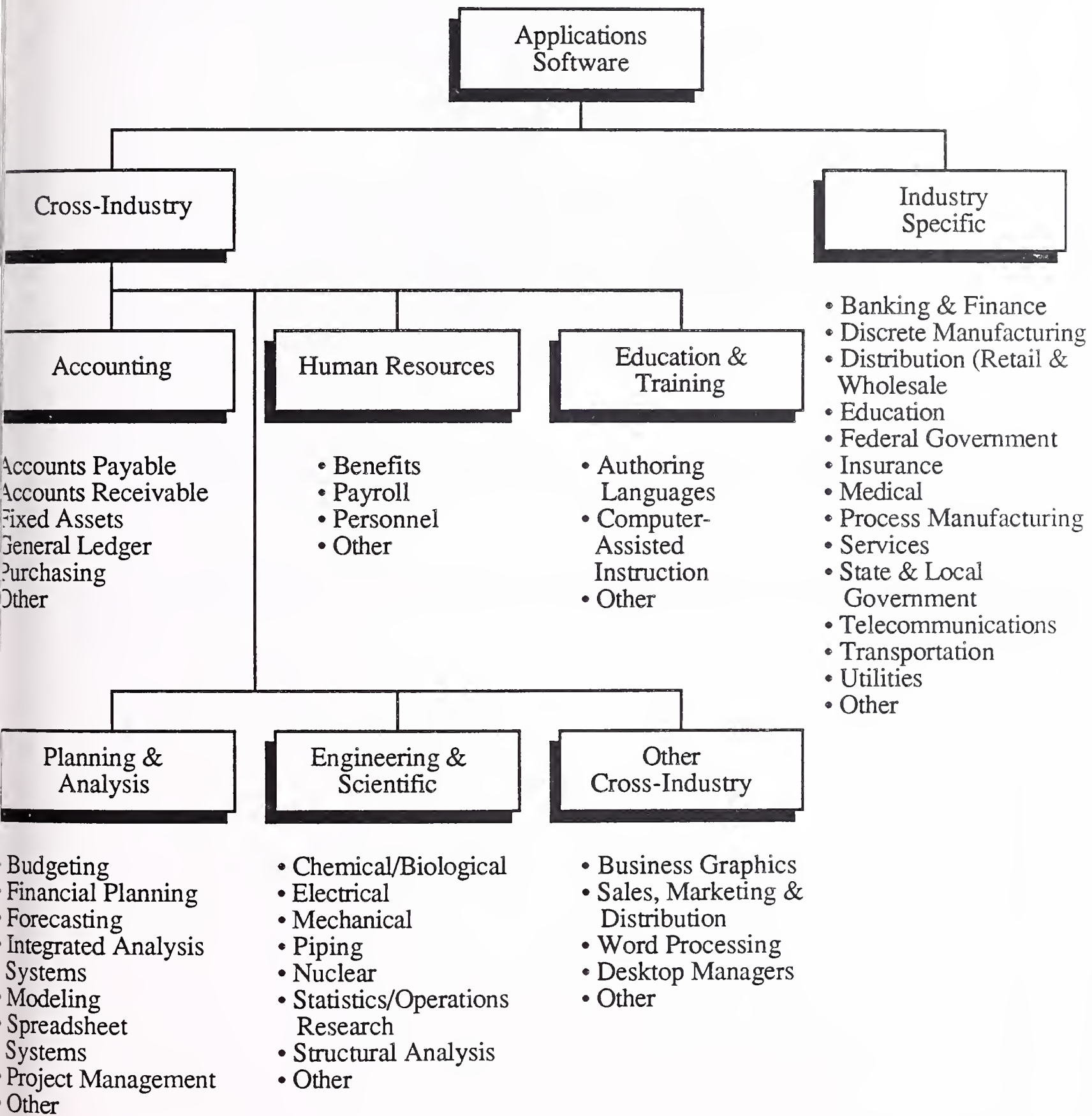


INPUT

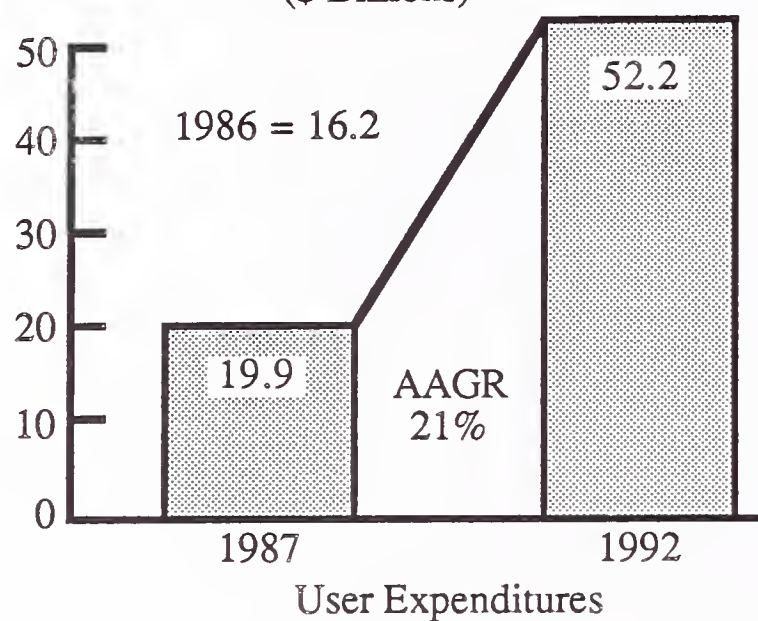
NOTES:

MPRE-89

SOFTWARE MARKET STRUCTURE



SOFTWARE PRODUCTS MARKET (\$ Billions)

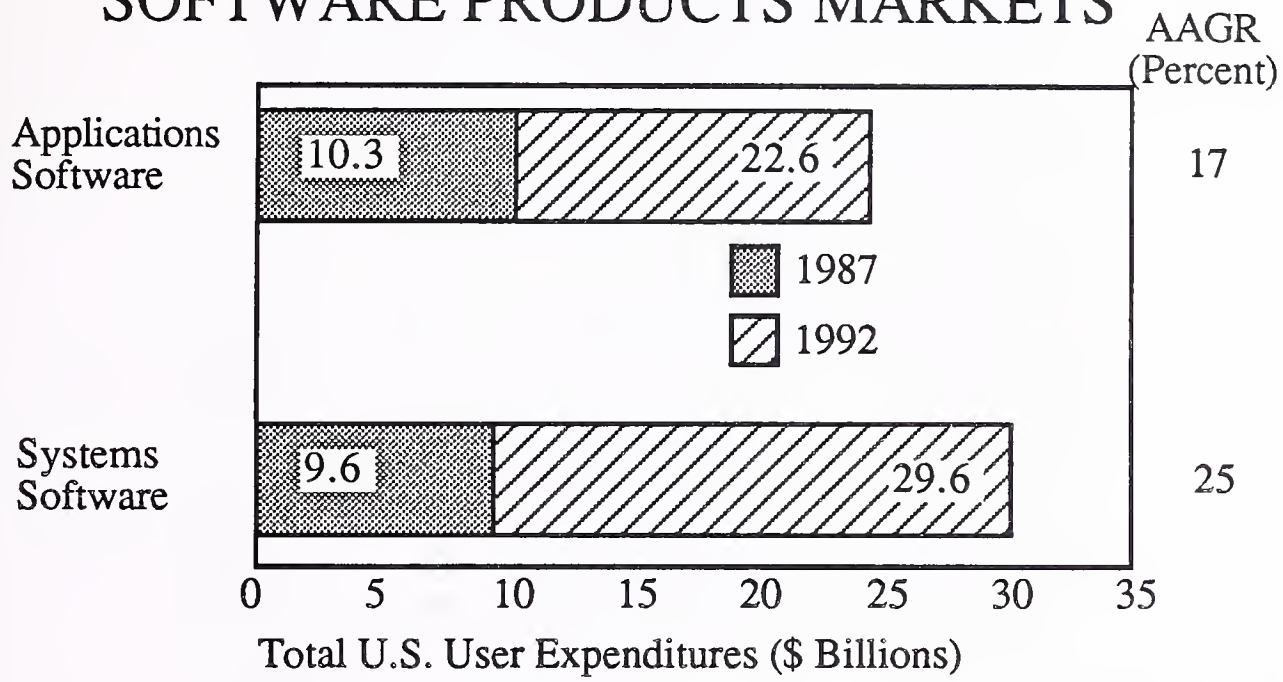


INPUT

NOTES:

MPRE-91

SOFTWARE PRODUCTS MARKETS



INPUT

NOTES:

MPRE-93

SOFTWARE PRODUCTS MARKET: DRIVING FORCES

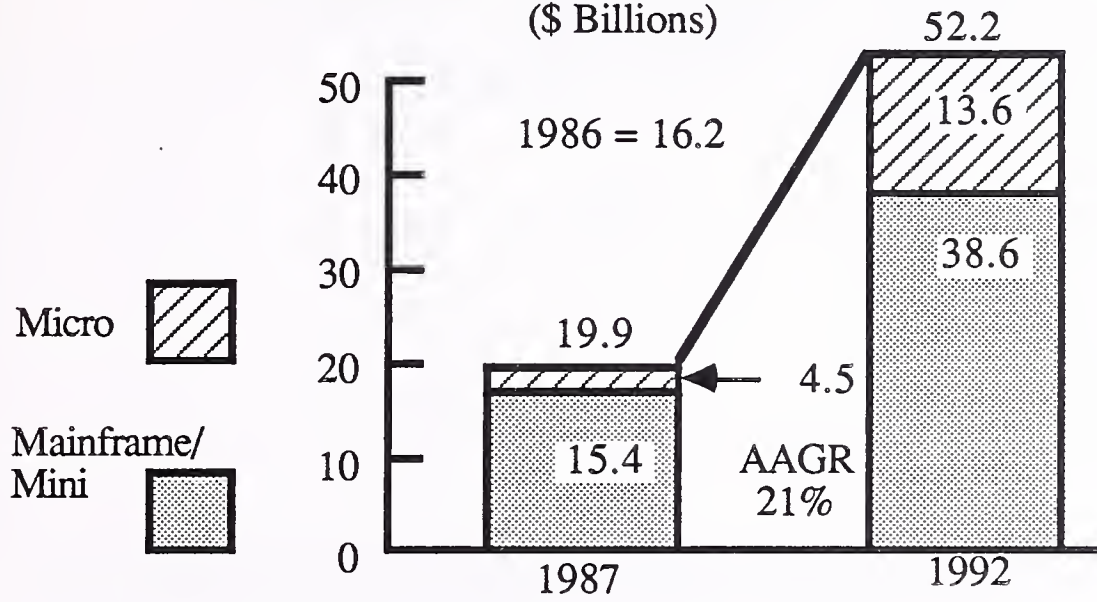
- Still in Growth Phase
 - New Opportunities Emerging
 - Cost of Developing Still Low
- Departmental Systems and Micro Hardware Units Increase
- Micro-Mainframe Linkages
- Increased User Sophistication Drives More Sophisticated Applications
- Buying Responsibility More Dispersed

INPUT

NOTES:

MPRE-123

SOFTWARE PRODUCTS MARKET FORECAST,
MAINFRAME/MINI AND MICRO: 1987-1992
(\$ Billions)



INPUT

NOTES:

MPRE-95

SOFTWARE PRODUCTS LARGEST VENDORS - 1986

	<u>(\$ Millions)</u>
IBM	2,900
DEC	618
HP	225
Lotus	218
Computer Associates	159
Ashton-Tate	158

INPUT

NOTES:

MPRE-97

**SOFTWARE PRODUCTS
LARGEST VENDORS - 1986**
(Non-Manufacturers)

	<u>(\$ Millions)</u>
Lotus	218
Computer Associates	159
Ashton-Tate	158
Microsoft	151
Management Science	145

Note: CAI plus UCCEL was #1 with \$272 million

INPUT

NOTES:

MPRE-98

**SOFTWARE PRODUCTS FAST-GROWING
VENDORS - 1986**
(More than Doubling)

	<u>Revenue (\$ Millions)</u>	<u>85-86 Growth (Times)</u>
Productivity Software	10	9.0
Knowledgware	9	2.6
Duquesne	19	1.6
Oracle	52	1.6

INPUT

NOTES:

MPRE-99

SOFTWARE PRODUCTS FAST-GROWING
VENDORS - 1986
(More than Doubling - continued)

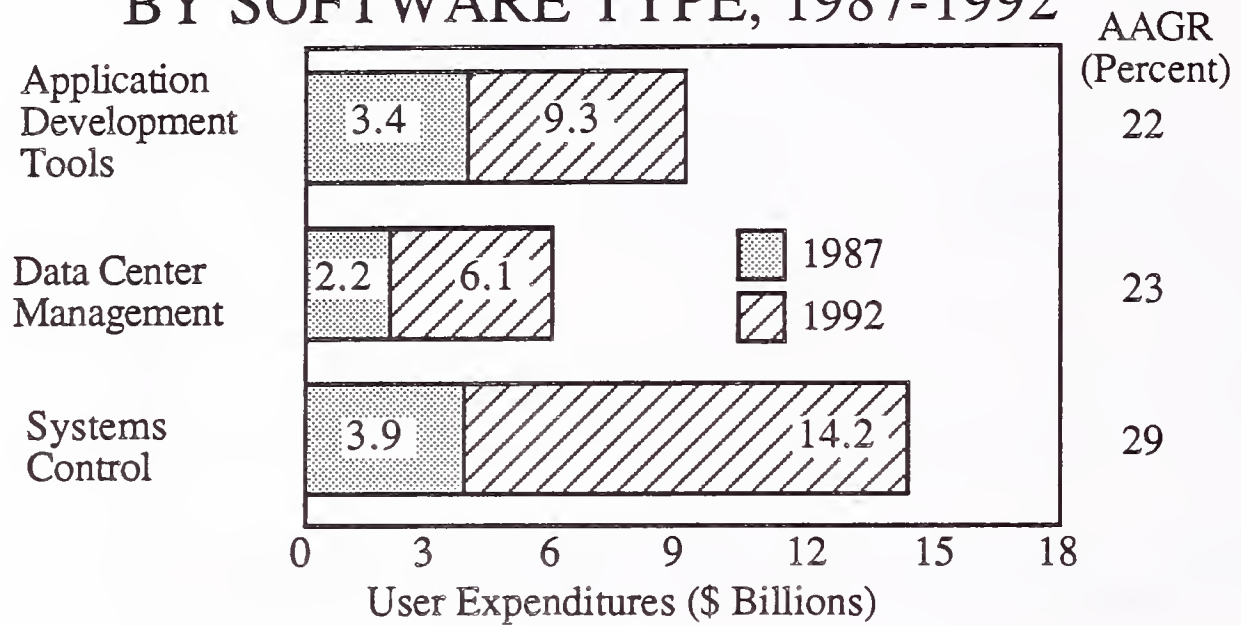
	<u>Revenue (\$ Millions)</u>	<u>85-86 Growth Times</u>
Innovative Software	13	1.5
Word Perfect	47	1.3
Sage Software	12	1.1
Gateway Communications	12	1.1
Informix	16	1.0

INPUT

NOTES:

MPRE-100

TOTAL SYSTEMS SOFTWARE MARKET BY SOFTWARE TYPE, 1987-1992

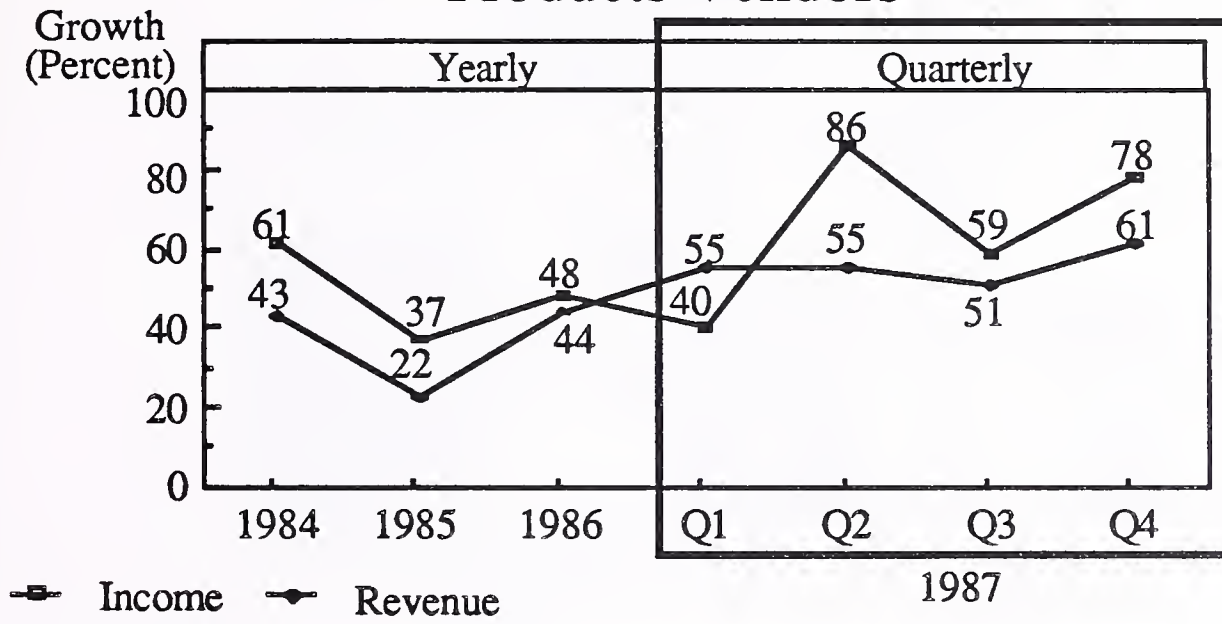


INPUT

NOTES:

MPRE-96

Public Systems Software Products Vendors

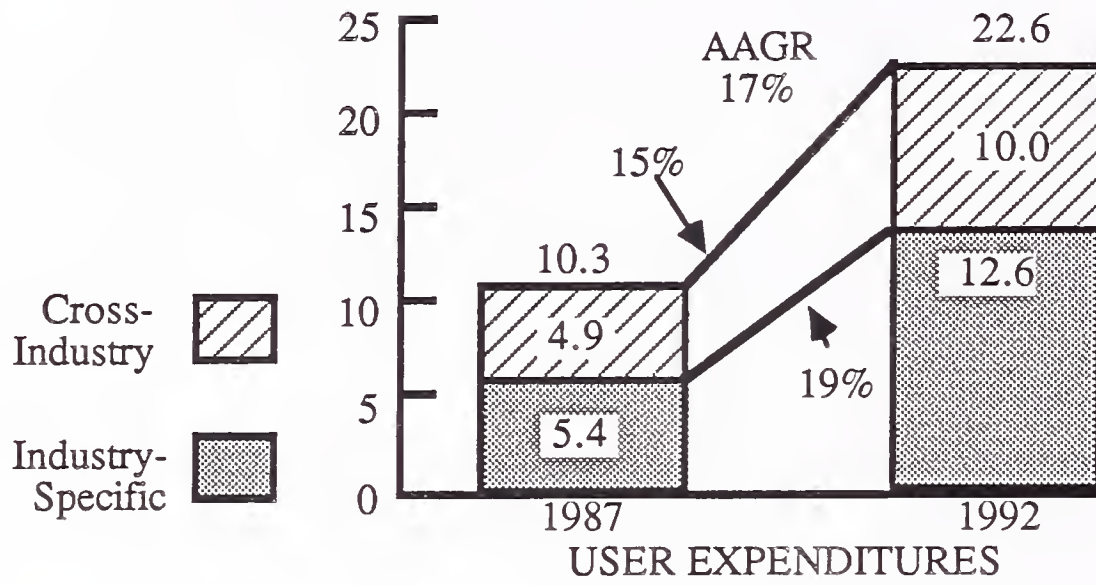


INPUT

NOTES:

MVFW Q4 MPRE-92

INDUSTRY-SPECIFIC APPLICATIONS
SOFTWARE TO INCREASE SIGNIFICANTLY
(\$ Billions)

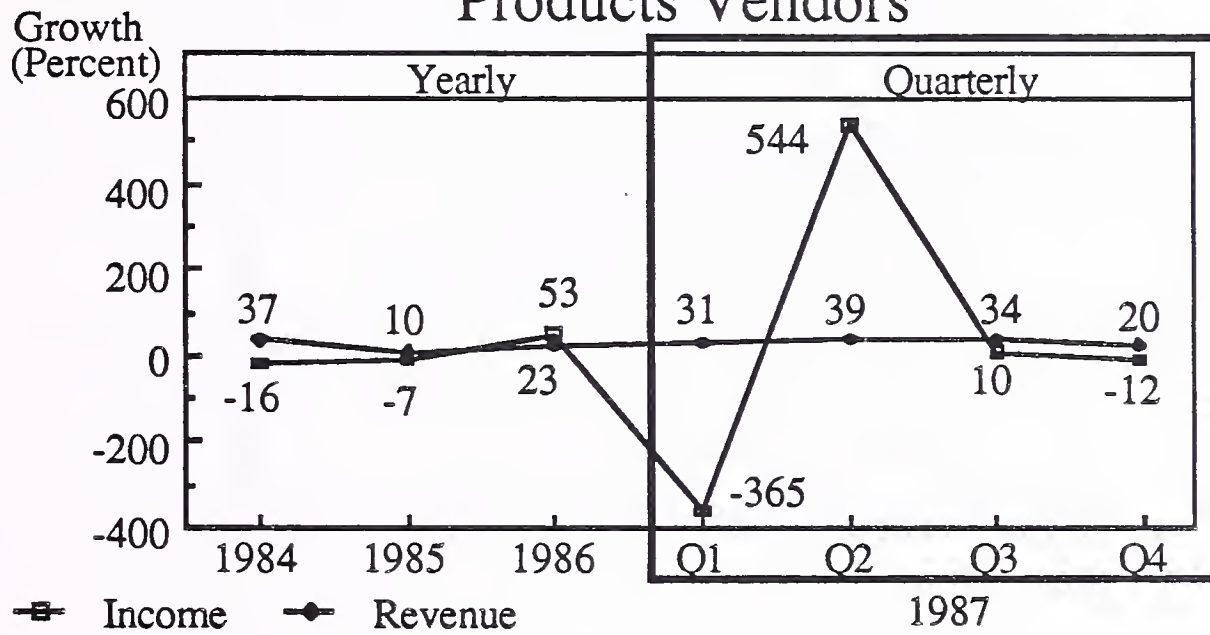


INPUT

NOTES:

MPRE-94

Public Application Software Products Vendors



INPUT

NOTES:

MVFW Q4 MPRE-92a

SOFTWARE PRODUCTS

HOT AREAS

- CASE
- Electronic Publishing
- Executive Information Systems (EIS)
- Data Center Management Tools
- Data Base Management Systems

INPUT

NOTES:

MPRE-101

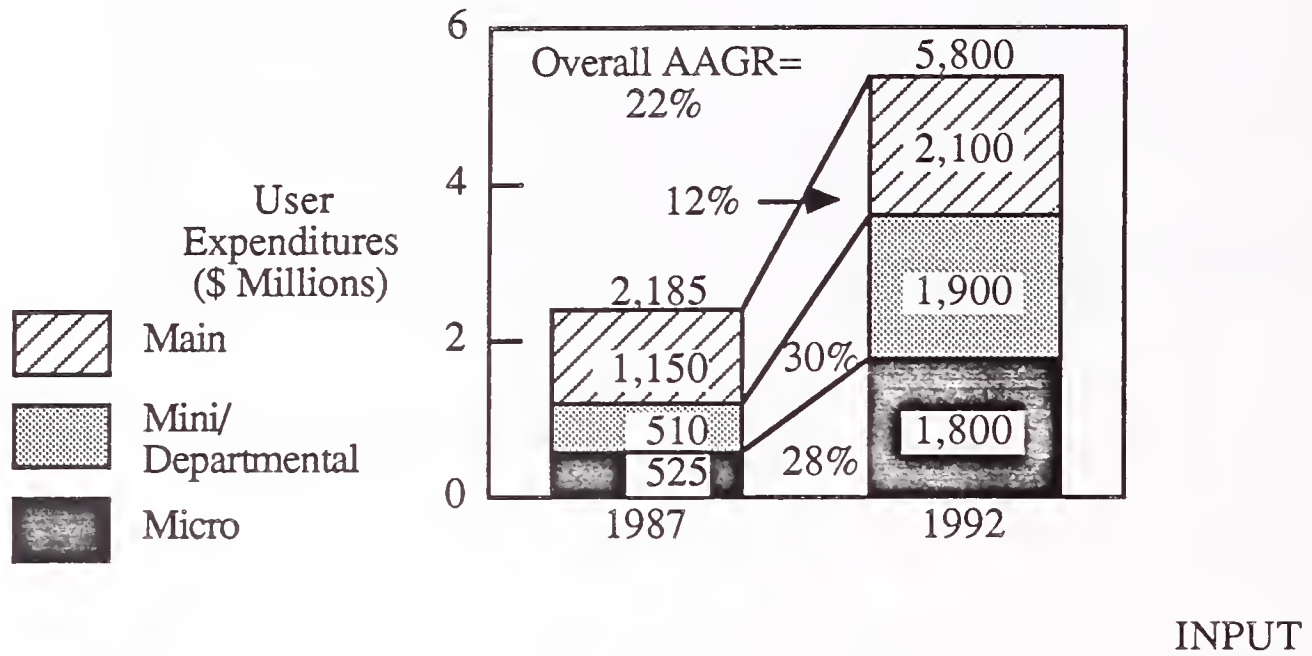
DATA BASE MANAGEMENT SYSTEMS
(DBMS)

INPUT

NOTES:

MPRE-102

FORECAST FOR DATABASE MANAGEMENT SYSTEMS: 1987-1992



NOTES:

DBMS FUTURES

- Distributed/Networked/Interconnected
Dictionary Integrity, Data Integrity,
Performance, Reliability, Platforms
Supported (Transparency)
- Relational+ Functionality
- High Performance
- Standards Support
- Portability
- Open Architecture

INPUT

NOTES:

MPRE-104

CHARACTERISTICS OF A DDBMS

- Distributed Query and Update Capability
- Network Data Management
- Elimination of Redundant Data Storage
- Platform Independence
- End User Transparency

INPUT

NOTES:

MPRE-105

DEFINING A DISTRIBUTED DATA BASE SYSTEM

- A Collection of Data Bases
- On Interconnected Computers
- Where:
 Individual DBMSs Manage Data
 Relationships Locally

 The Distributed DBMS Manages
 Data Relationships Between Systems

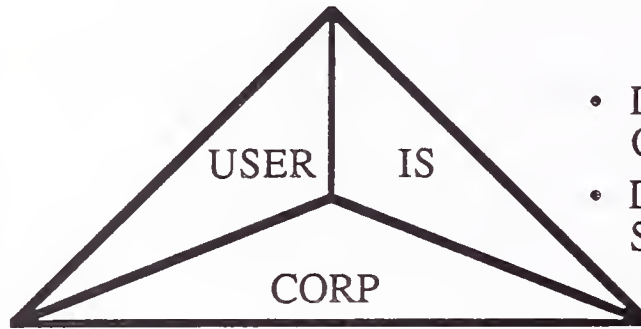
INPUT

NOTES:

MPRE-106

THREE VIEW POINTS

- Local
Autonomy
- Transparency



- Distributed
Control
- Data
Synchronization

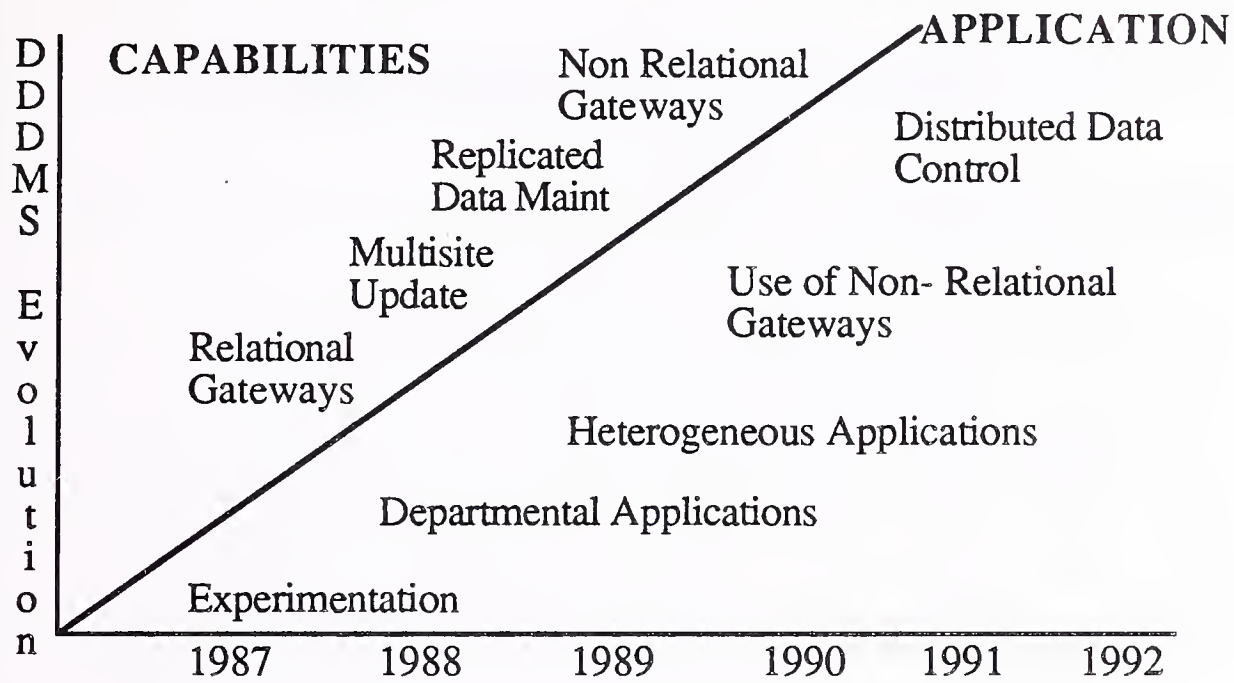
- Balanced Distribution
- Reduced Redundancy
- Ease of Access

INPUT

NOTES:

MPRE-107

EVOLUTION OF DDBMS



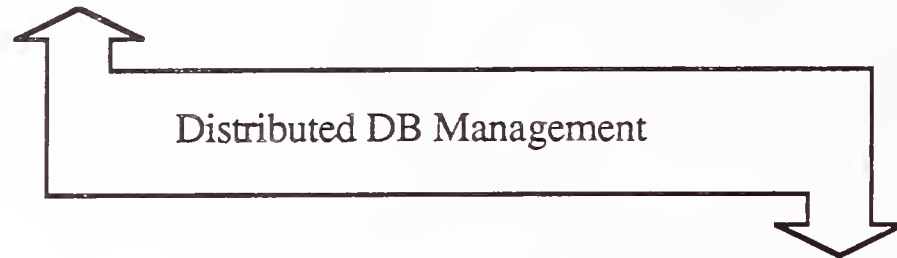
INPUT

NOTES:

MPRE-108

STRATEGIC IMPLICATIONS FOR IS

Vehicle for Integration



Or, Controlled Decentralization

INPUT

NOTES:

MPRE-109

DBMS ARCHITECTURES OVER TIME

	1970s	1980s	1990s*
Hierarchical	100	78	35
Relational	*	20	50
Distributed	-	2	15

* 1992

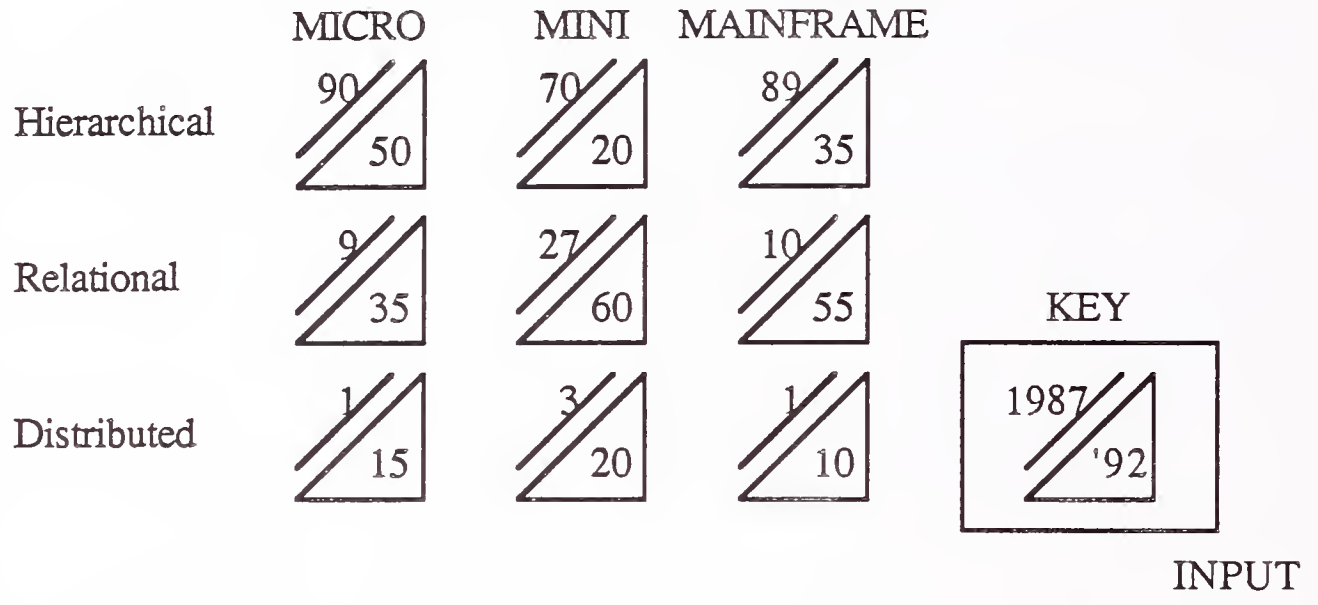
INPUT

NOTES:

MPRE-110

INPUT

DBMS ARCHITECTURE BREAKDOWN BY PLATFORM, 1987-1992



NOTES:

STRATEGIES AND RECOMMENDATIONS

- Participate in Non-IBM Environments
- Participate in DB2 "Market"
- Develop Strategic Partners
- Develop Applications and Tools Base

INPUT

NOTES:

MPRE-112

INPUT

ADVANCED
PRODUCTS

INPUT

NOTES:

MPRE-113

COMPUTER AIDED SOFTWARE ENGINEERING (CASE)

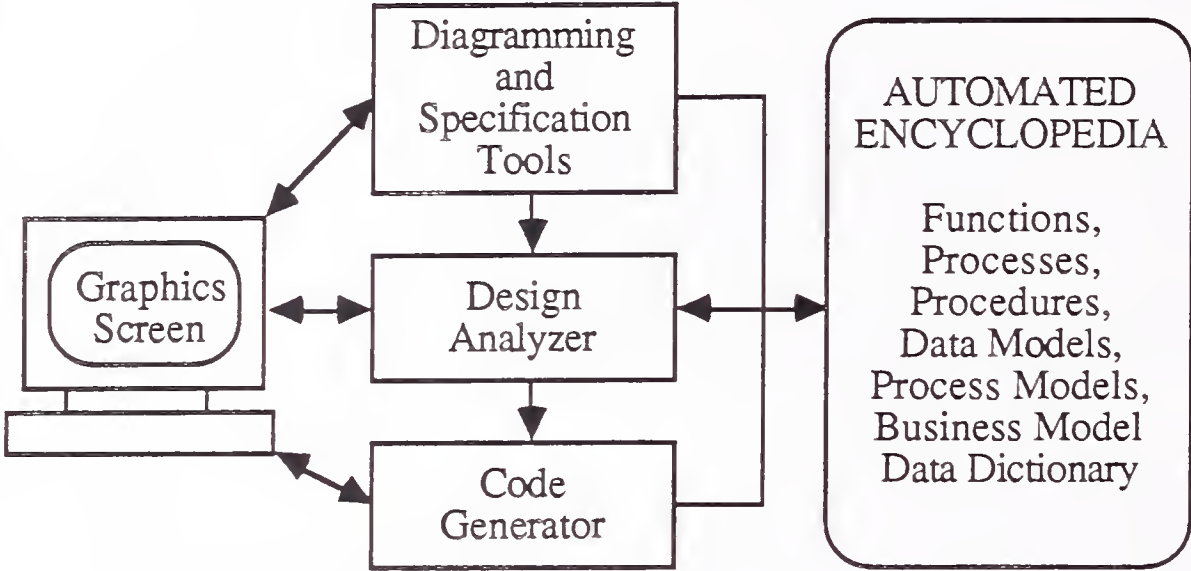
- Forces Disciplined Response to System Development
- Interactive, Graphic Design, Development Testing
- Tools and Process for the Entire Software System Life Cycle
- Support COBOL, PL/1, C, ADA
- Requires Selection of a Development Methodology

INPUT

NOTES:

MPRE-114

CASE CHARACTERISTICS



INPUT

NOTES:

MPRE-115

VENDOR CHARACTERISTICS

Vendor Group	Thrust	Process Understanding	Flexibility
Applications Software	Standard Package	LTD	Low
System Manufacturers	Box	Variable	Medium
Professional Services	People	Variable	High
Systems Integrators	Solution	Medium	Very High

INPUT

NOTES:

MPRE-116

SOFTWARE PRODUCT INTEGRATION OPPORTUNITY

Macro Level

- Applications Development Tools
- CASE
- Standards Implementation
- Networking

INPUT

NOTES:

MPRE-117

SOFTWARE PRODUCT INTEGRATION MARKET

Micro Level

- Increased Functionality
- Expert System Shells
- Portability
- Connectivity
- Open Architecture

INPUT

NOTES:

MPRE-118

EDI
SOFTWARE

INPUT

NOTES:

MPRE-119

INPU

SOFTWARE SUPPORT MARKET

INPUT

NOTES:

MPRE-224

SAMPLE BY VENDOR

Software Vendor	Interviews
ADR	30
Cullinet	30
DEC	31
IBM	30
McCormack & Dodge	30

INPUT

NOTES:

MPRE-230A

SAMPLE BY VENDOR

(Continued)

Software Vendor	Interviews
MSA	30
NCA	30
Pansophic	30
Sterling	31
UCCEL	30
Total	302

INPUT

NOTES:

MPRE-230B

SOFTWARE SUPPORT MARKET BY COMPONENT 1987-1992

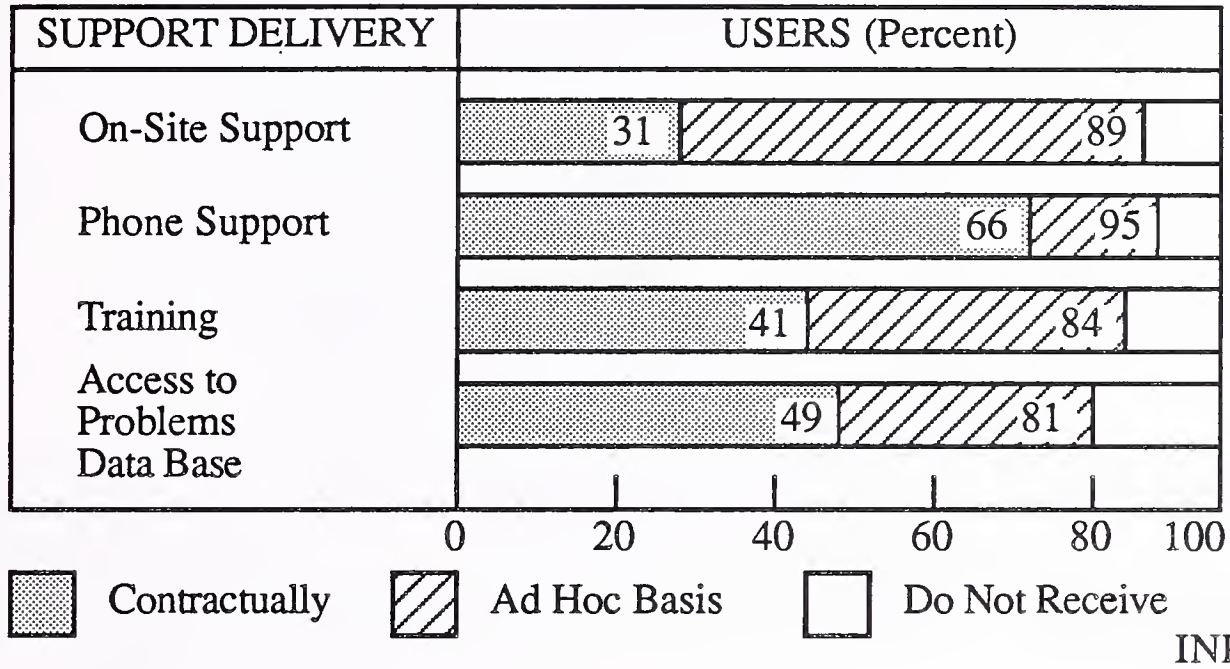
COMPONENT	\$ MILLIONS		AAGR (Percent)
	1987	1992	
Software "Maintenance"	1,815	5,670	26
Installation & Tailoring	330	1,410	34
Consulting	495	1,850	30
Education (Including Documentation)	660	1,970	24
Total	3,300	10,900	27

INPUT

NOTES:

MPRE-225

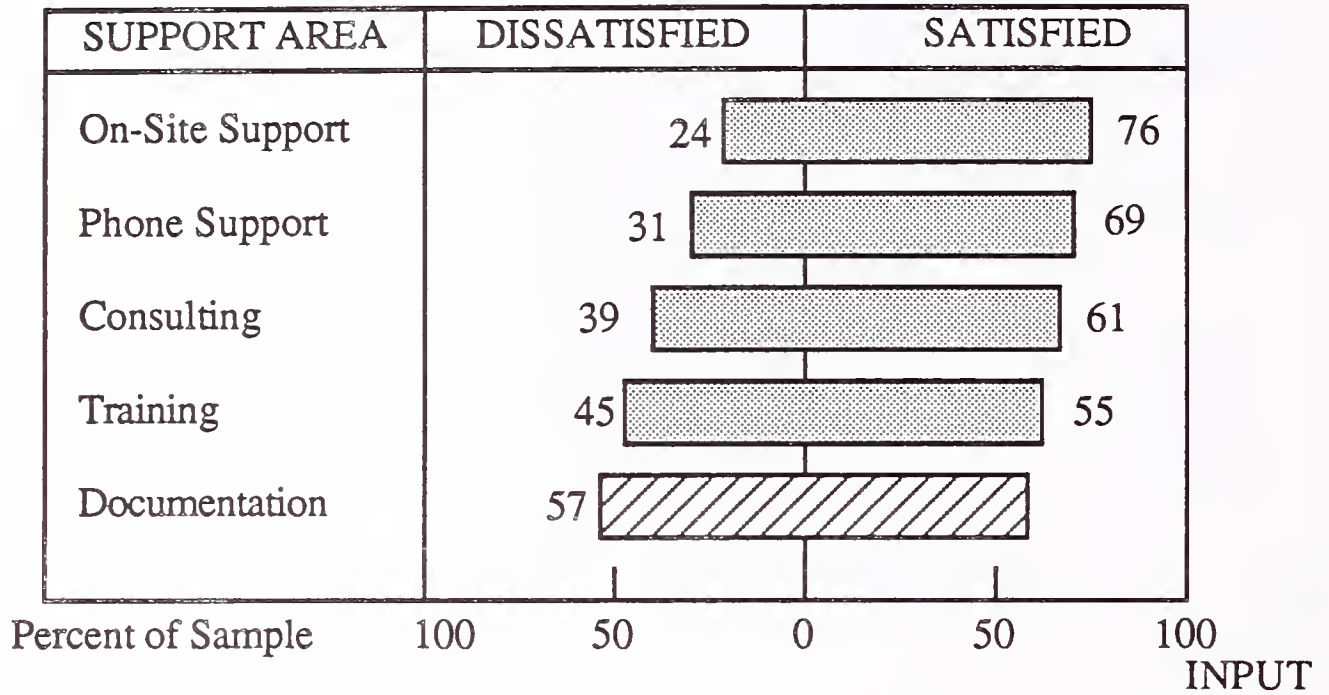
SOFTWARE SUPPORT DELIVERY



NOTES:

MPRE-226

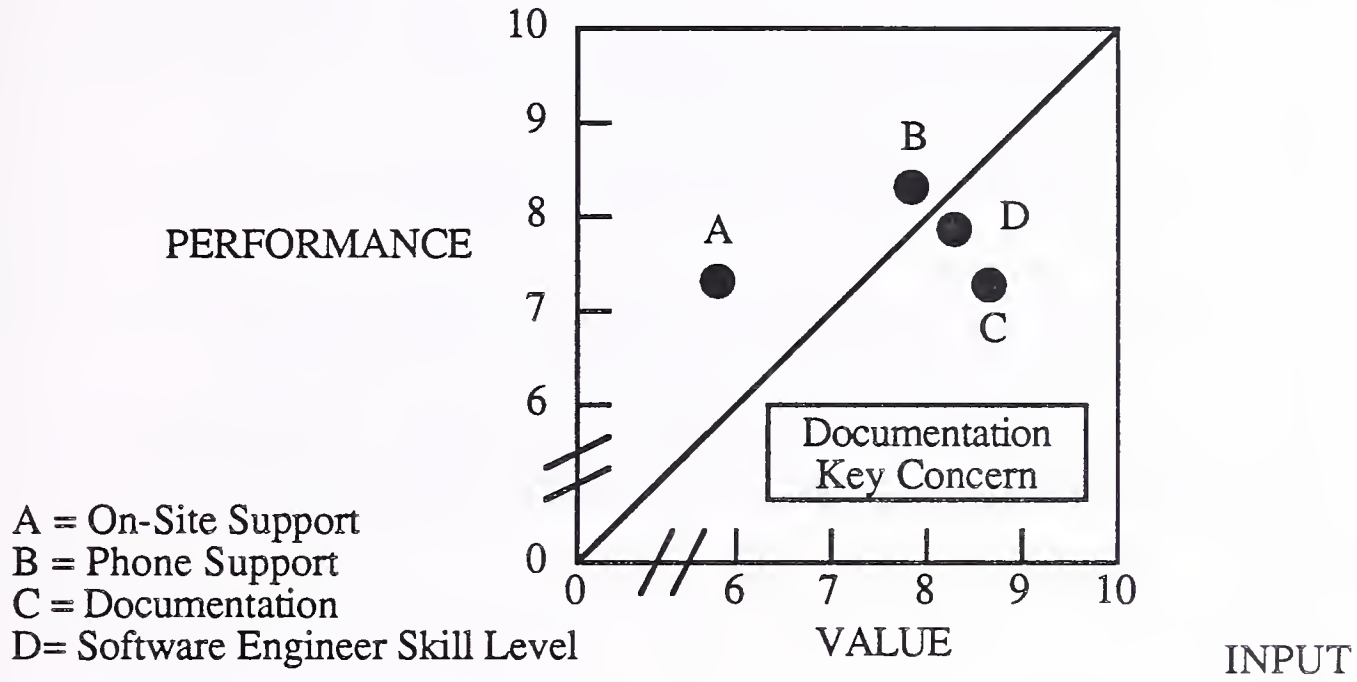
Software Support Satisfaction By Support Area



NOTES:

MPRE-228

SOFTWARE DOCUMENTATION NEEDS UNMET



NOTES:

MPRE-227

END-USER TRAINING

- Vendors and Users Share Blame:
 - Users Don't Express Requirement
 - Vendors Don't Market Training

- Result:
 - Users Dissatisfied with Performance
 - Vendor Support Costs Rise

INPUT

NOTES:

MPRE-229

USER SATISFACTION WITH SOFTWARE SUPPORT PERFORMANCE - MSA



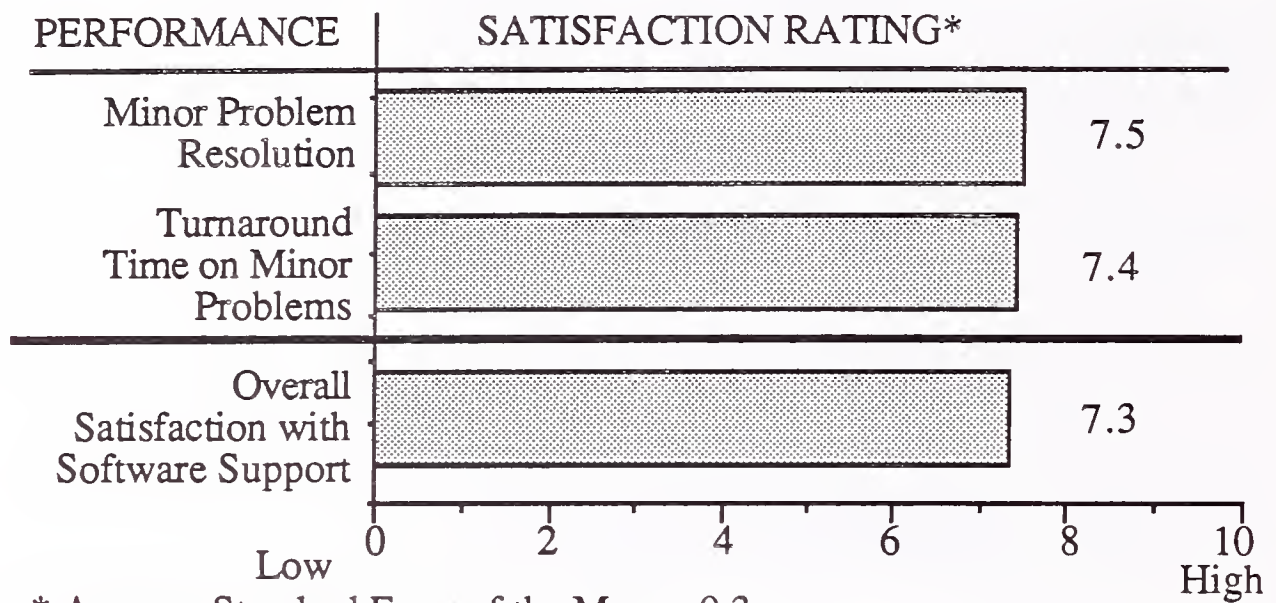
*Average Standard Error of the Mean: 0.3

INPUT

NOTES

MPRE-216A

USER SATISFACTION WITH SOFTWARE SUPPORT PERFORMANCE - MSA (Continued)



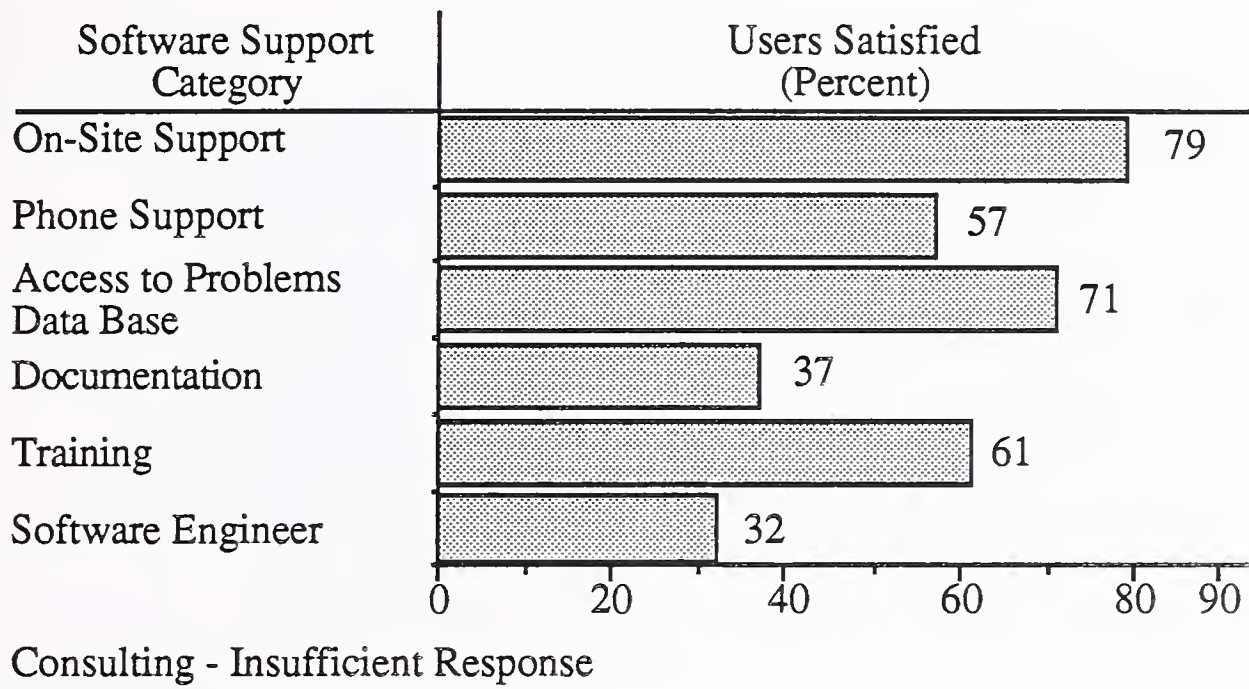
* Average Standard Error of the Mean: 0.3

INPUT

NOTES:

MPRE-216B

SOFTWARE SUPPORT SATISFACTION LEVELS - MSA

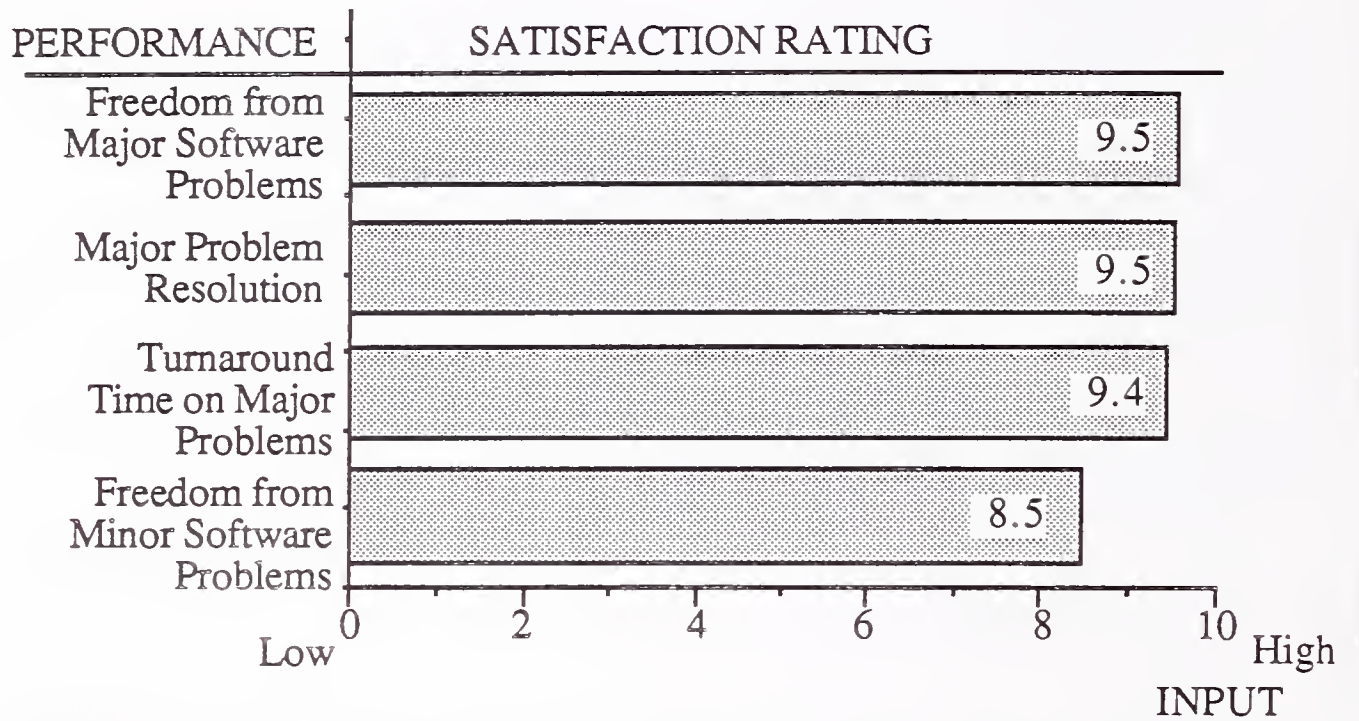


INPUT

NOTES

MPRE-217

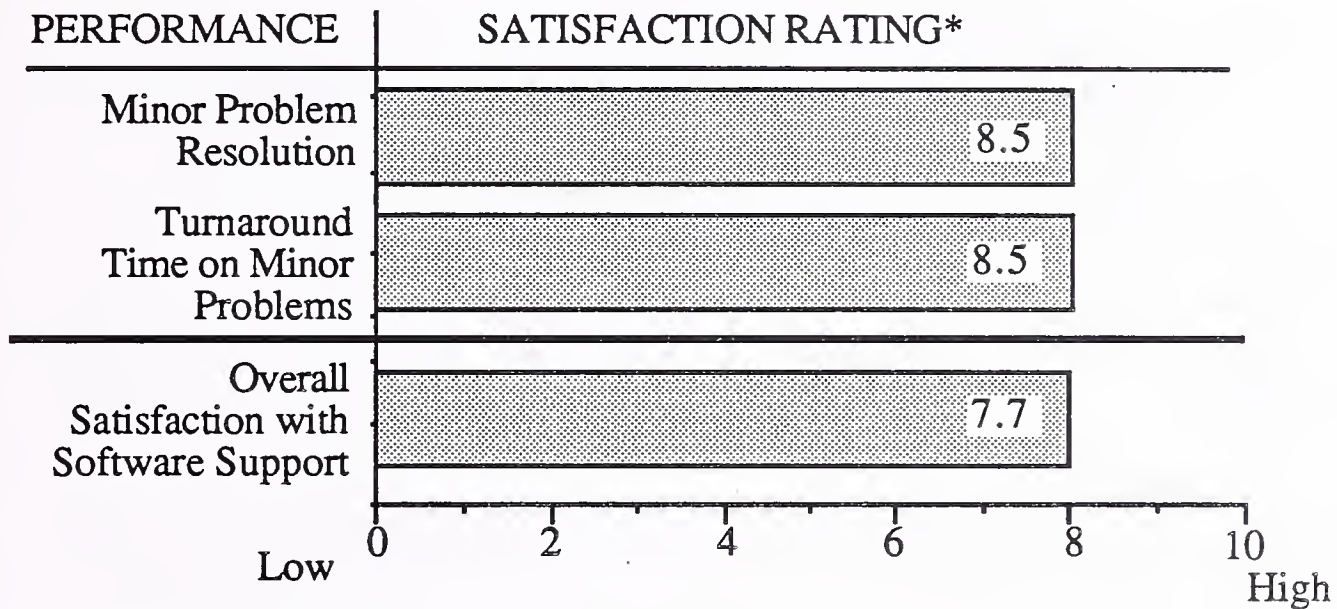
USER SATISFACTION WITH SOFTWARE SUPPORT PERFORMANCE - McCORMACK & DODGE



NOTES:

MPRE-218A

USER SATISFACTION WITH SOFTWARE SUPPORT
PERFORMANCE -McCORMACK & DODGE (Continued)



* Average Standard Error of the Mean: 0.3

INPUT

NOTES:

MPRE-218B

SOFTWARE SUPPORT VALUE/PERFORMANCE LEVELS -
MSA

Software Support Category	Level of Support		Performance Exceeds (Falls Below) User Value
	Value	Performance	
On-Site Support	6.5	6.8	0.3
Phone Support	8.0	7.8	(0.2)
Access to Problems Data Base	7.6	7.5	(0.1)
Documentation	9.0	7.3	(1.7)

Scale: 1 = Low, 10 = High

Average Standard Error of the Mean: 0.4

INPUT

NOTES:

MPRE-219A

**SOFTWARE SUPPORT VALUE/PERFORMANCE LEVELS -
MSA (Continued)**

Software Support Category	Level of Support		Performance Exceeds (Falls Below) User Value
	Value	Performance	
Training	8.6	7.9	(0.7)
Consulting	*	*	*
Software Engineer Skill Level	9.3	7.2	(2.1)

Scale: 1 = Low, 10 = High

Average Standard Error of the Mean: 0.4

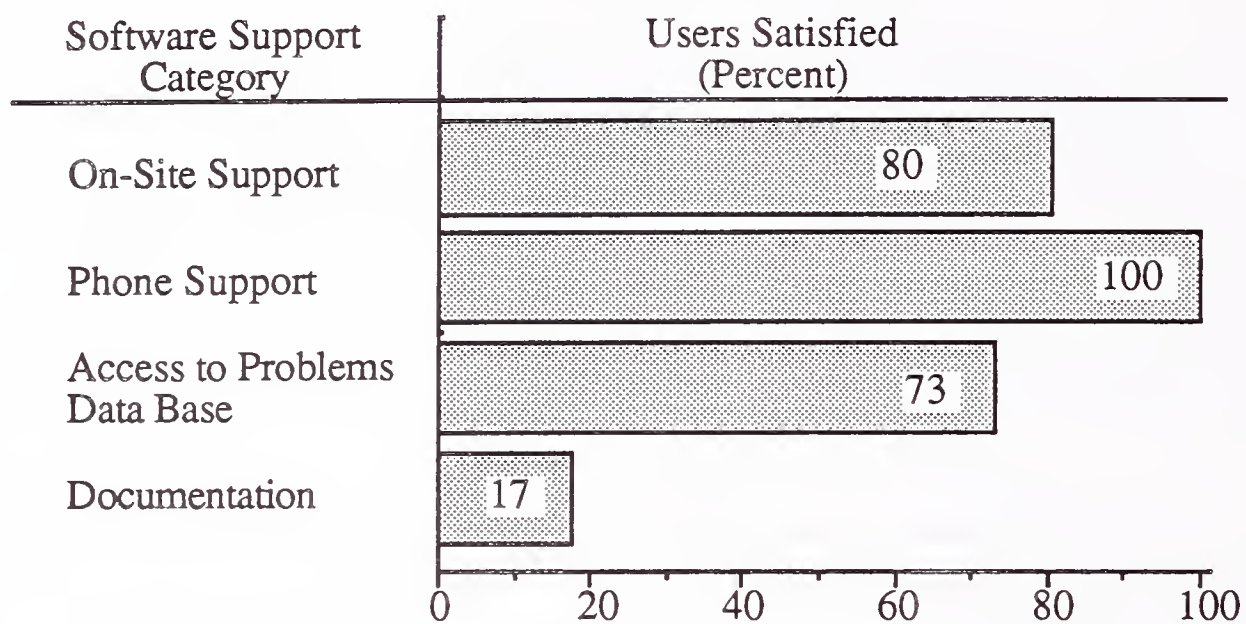
*Insufficient Response

INPUT

NOTES:

MPRE-219B

SOFTWARE SUPPORT SATISFACTION LEVELS McCORMACK & DODGE

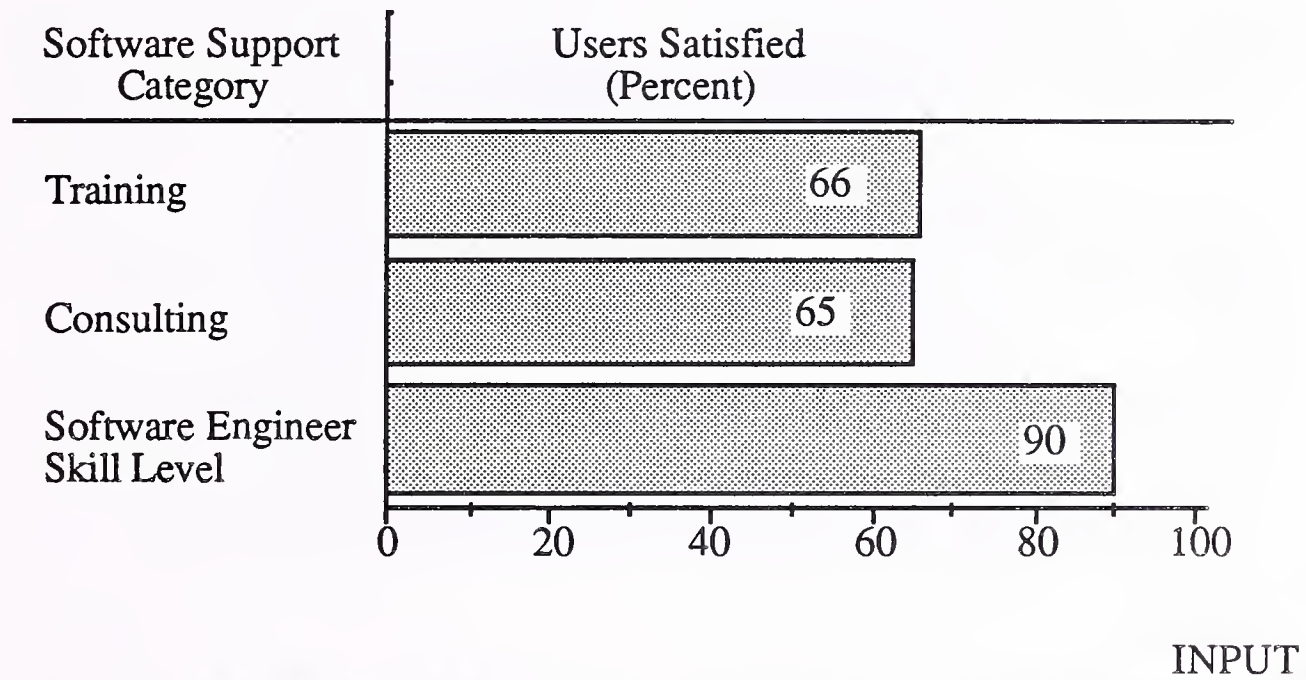


INPUT

NOTES

MPRE-220A

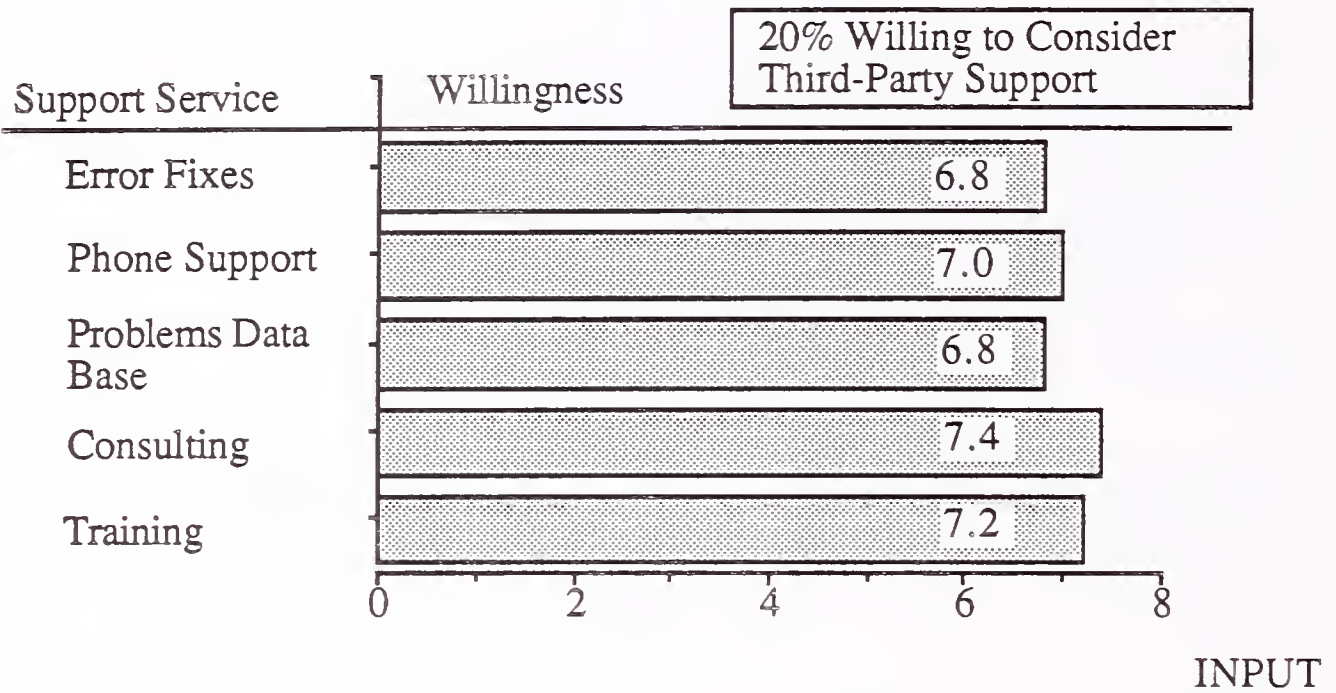
SOFTWARE SUPPORT SATISFACTION LEVELS McCORMACK & DODGE



NOTES

MPRE-220B

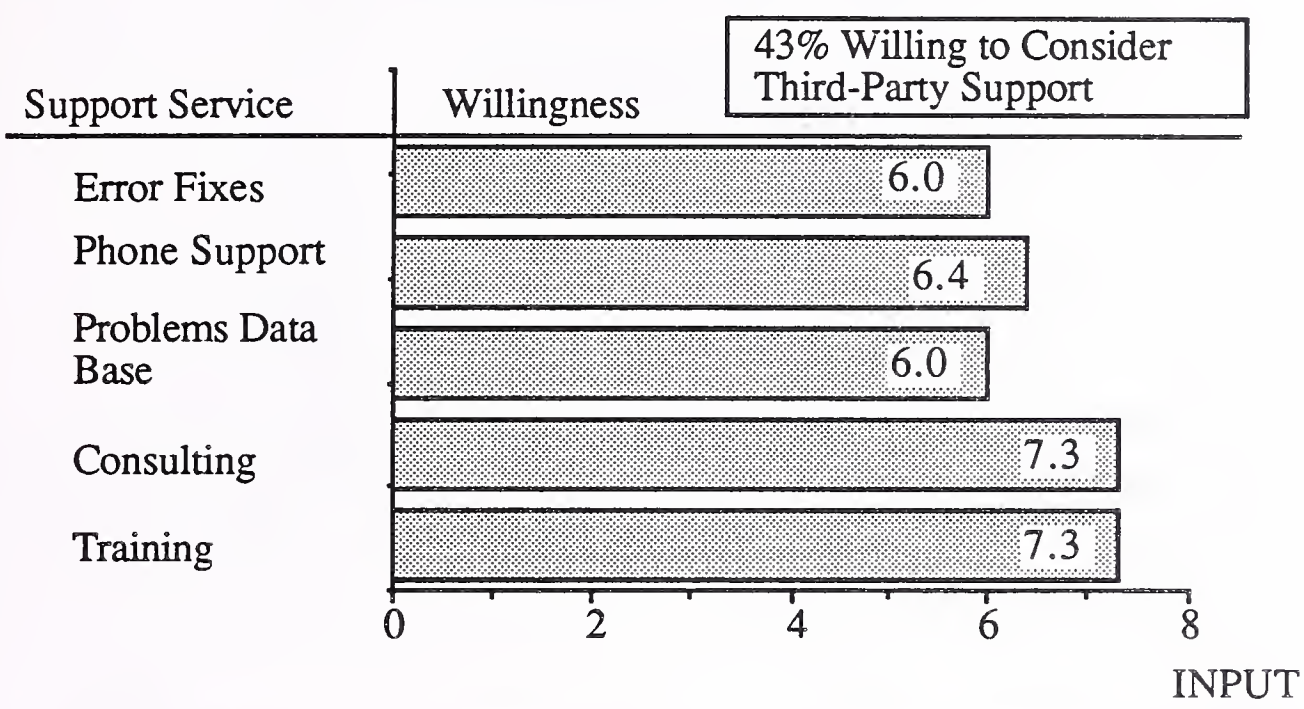
WILLINGNESS TO CONSIDER THIRD-PARTY SOFTWARE SUPPORT - McCORMACK & DODGE



NOTES:

MPRE-221

WILLINGNESS TO CONSIDER THIRD-PARTY SOFTWARE SUPPORT - MSA



NOTES:

MPRE-222

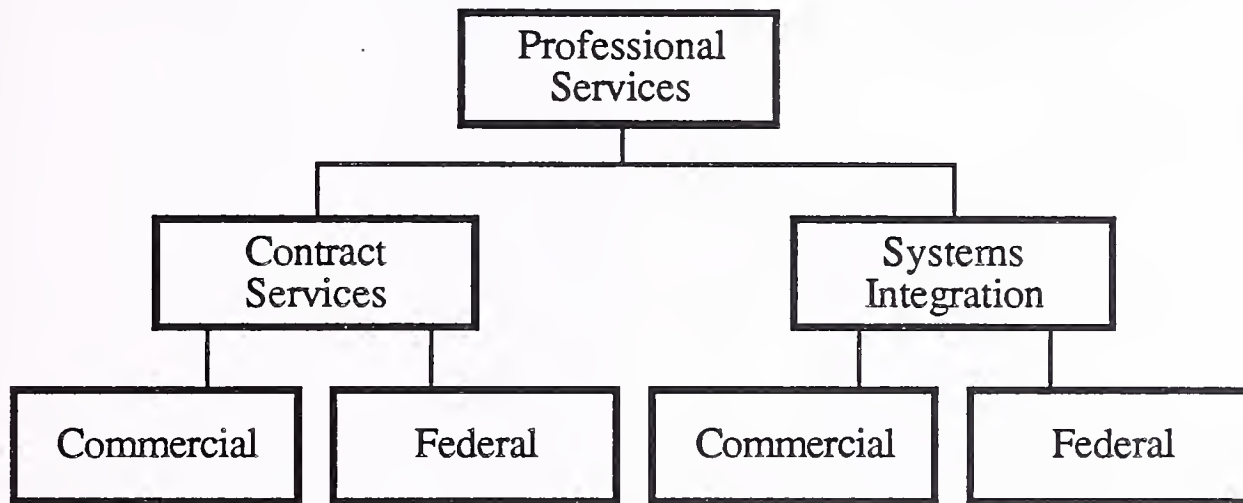
PROFESSIONAL SERVICES

INPUT

NOTES:

MPRE-124

PROFESSIONAL SERVICES MARKET STRUCTURE

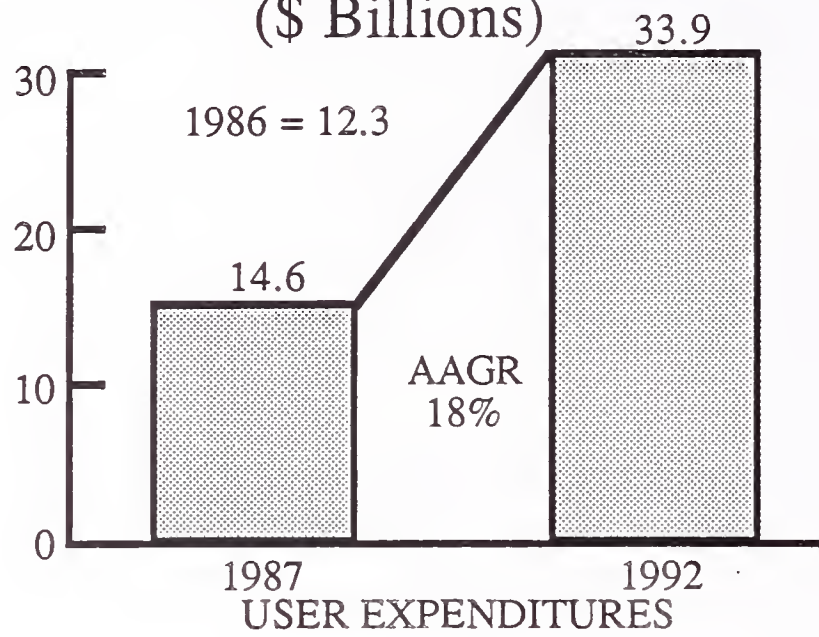


INPUT

NOTES:

MPRE-125

PROFESSIONAL SERVICES MARKET (\$ Billions)

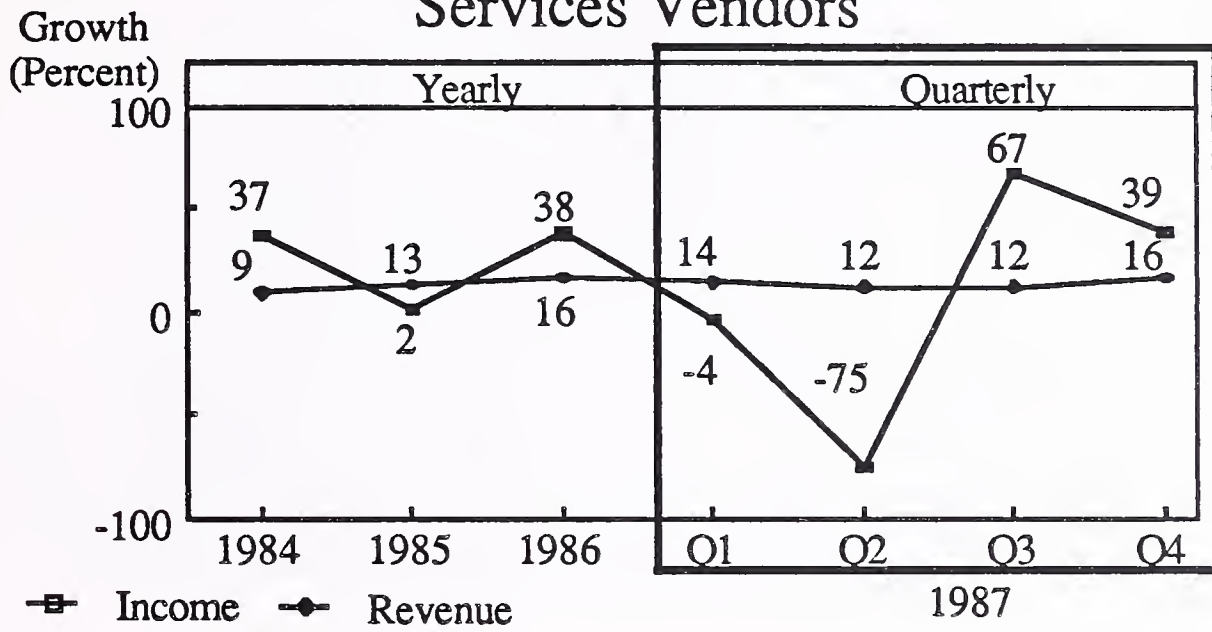


INPUT

NOTES:

MPRE-126

Public Government Professional Services Vendors

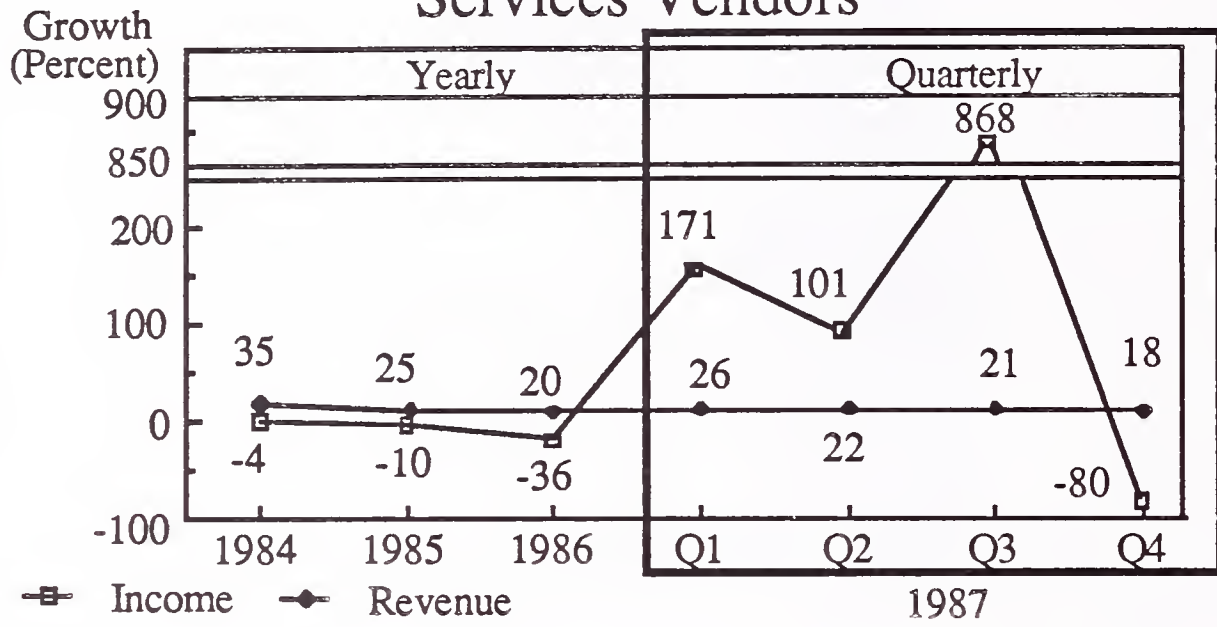


INPUT

NOTES:

MVFW Q4 MPRE-127

Public Commercial Professional Services Vendors

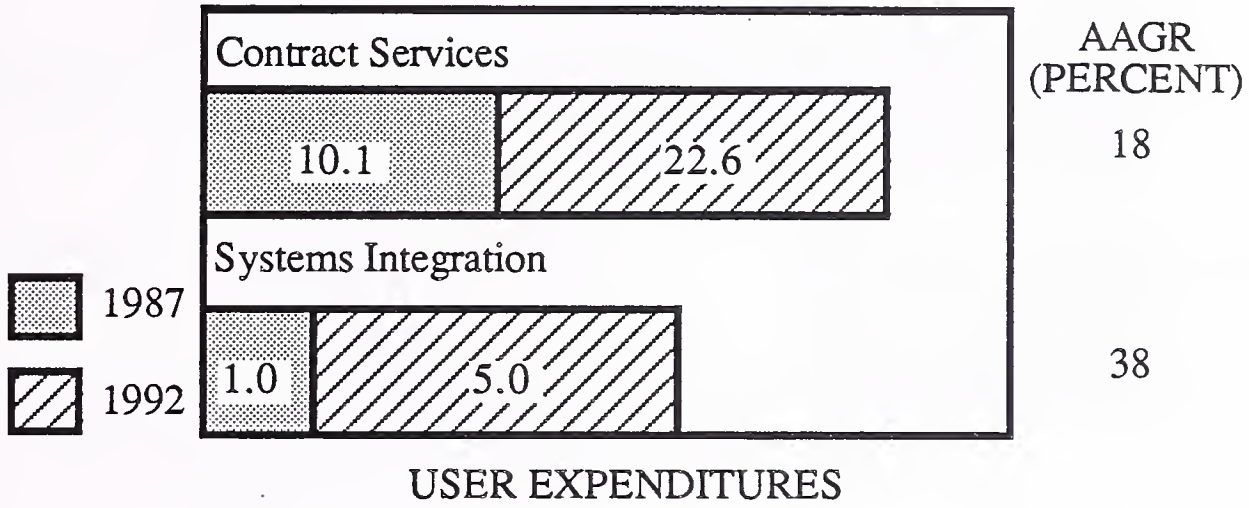


INPUT

NOTES:

MVFW Q4 MPRE-127a

PROFESSIONAL SERVICES MARKETS
 COMMERCIAL SEGMENTS
 1987-1992
 (\$BILLIONS)

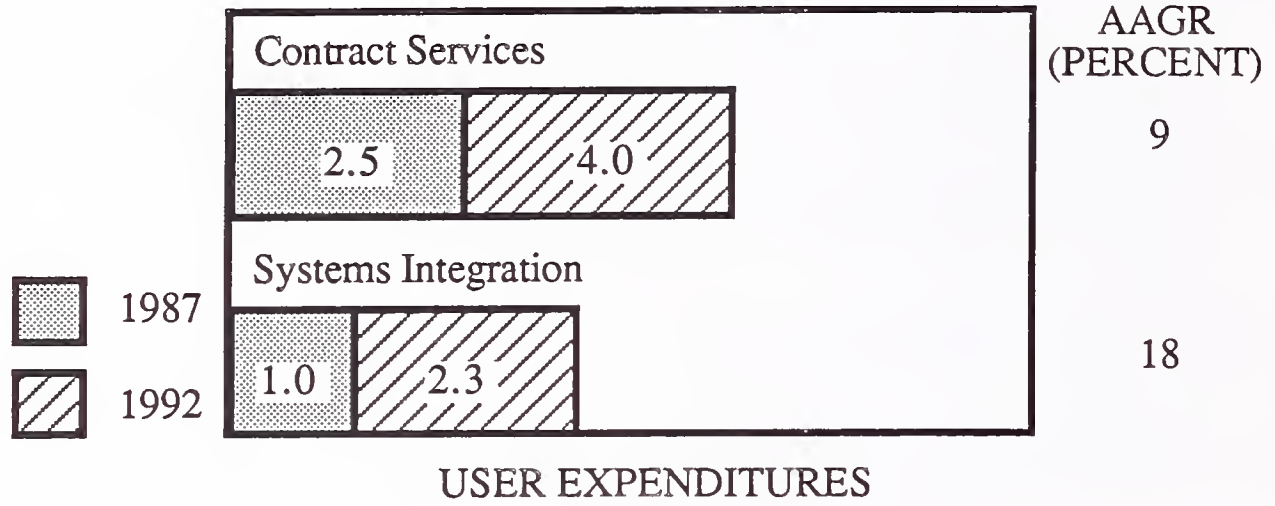


INPUT

NOTES:

MPRE-128

PROFESSIONAL SERVICES MARKETS
 FEDERAL SEGMENT
 1987-1992
 (\$BILLIONS)



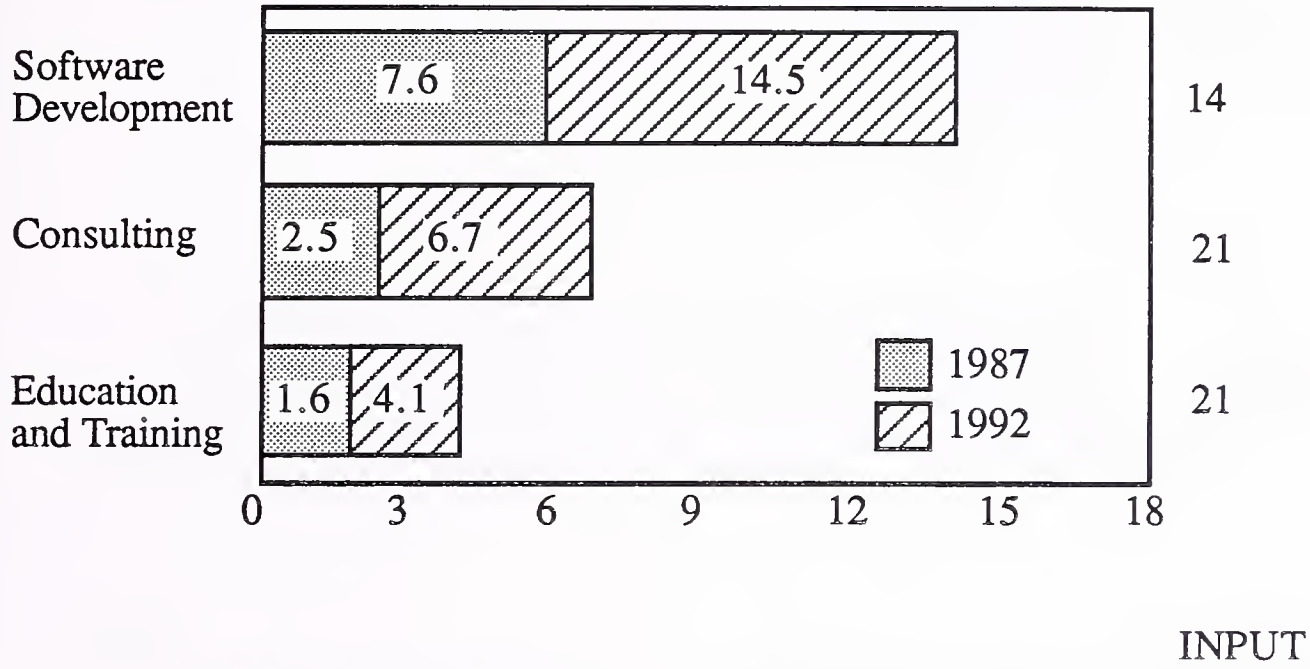
NOTES:

MPRE-129

PROFESSIONAL SERVICES MARKET BY MODE

(Federal and Commercial)

AAGR
(Percent)



NOTES:

MPRE-130

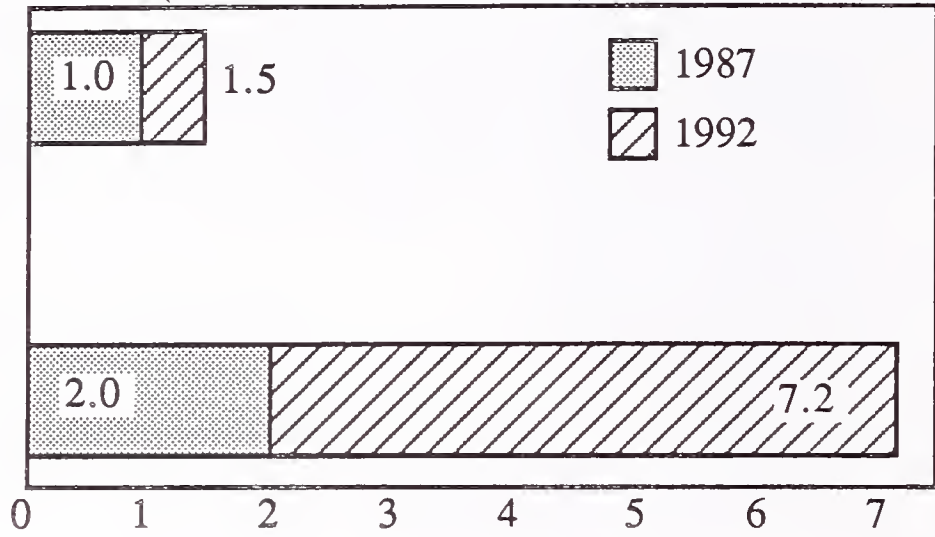
PROFESSIONAL SERVICE MARKET BY MODE

(Federal and Commerical)

AAGR
(Percent)

Professional
Services
FM

Systems
Integration



10

30

INPUT

NOTES:

MPRE-131

PROFESSIONAL SERVICES
LARGEST VENDORS - 1986

	Revenue (\$ Millions)
IBM	1,495
CSC	614
Arthur Andersen	400
BDM Intl	322
Planning Research	255

INPUT

NOTES:

MPRE-178

PROFESSIONAL SERVICES
LARGEST VENDORS - 1986
(Continued)

	<u>Revenue (\$ Millions)</u>
UNISYS	241
EDS	241
BBN	170
Logicon	170
TRW	165

INPUT

NOTES:

MPRE-179

PROFESSIONAL SERVICES FAST-GROWING VENDORS - 1986

	<u>Revenue (\$ Millions)</u>	<u>85-86 Growth (Percent)</u>
Perceptronics	24	111
Carnegie	9	79
Brandon Systems	19	77
Cornell Computer	33	55

INPUT

NOTES:

MPRE-180

PROFESSIONAL SERVICES: DRIVING FORCES

- Differentiation Phase
 - New Markets Emerging
 - Cost of Entry Medium
 - High Growth
 - People Intensive

INPUT

NOTES:

MPRE-180A

PROFESSIONAL SERVICES:
DRIVING FORCES
(Continued)

- Specialization Increasing
- Distribution Potential
- Alliances
- Product Sophistication

INPUT

NOTES:

MPRE-180B

SYSTEMS INTEGRATION

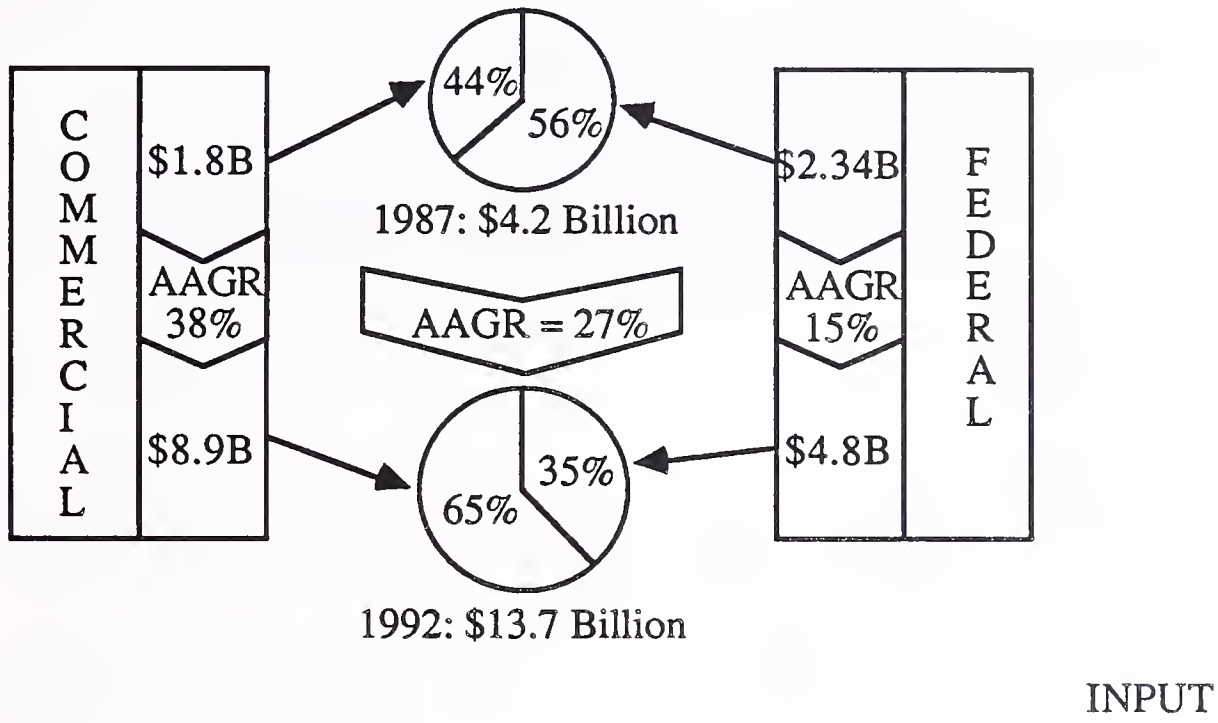
“The Provision of a Total Solution to a
Multidisciplinary Information Systems Requirement”

INPUT

NOTES:

MPRE-132

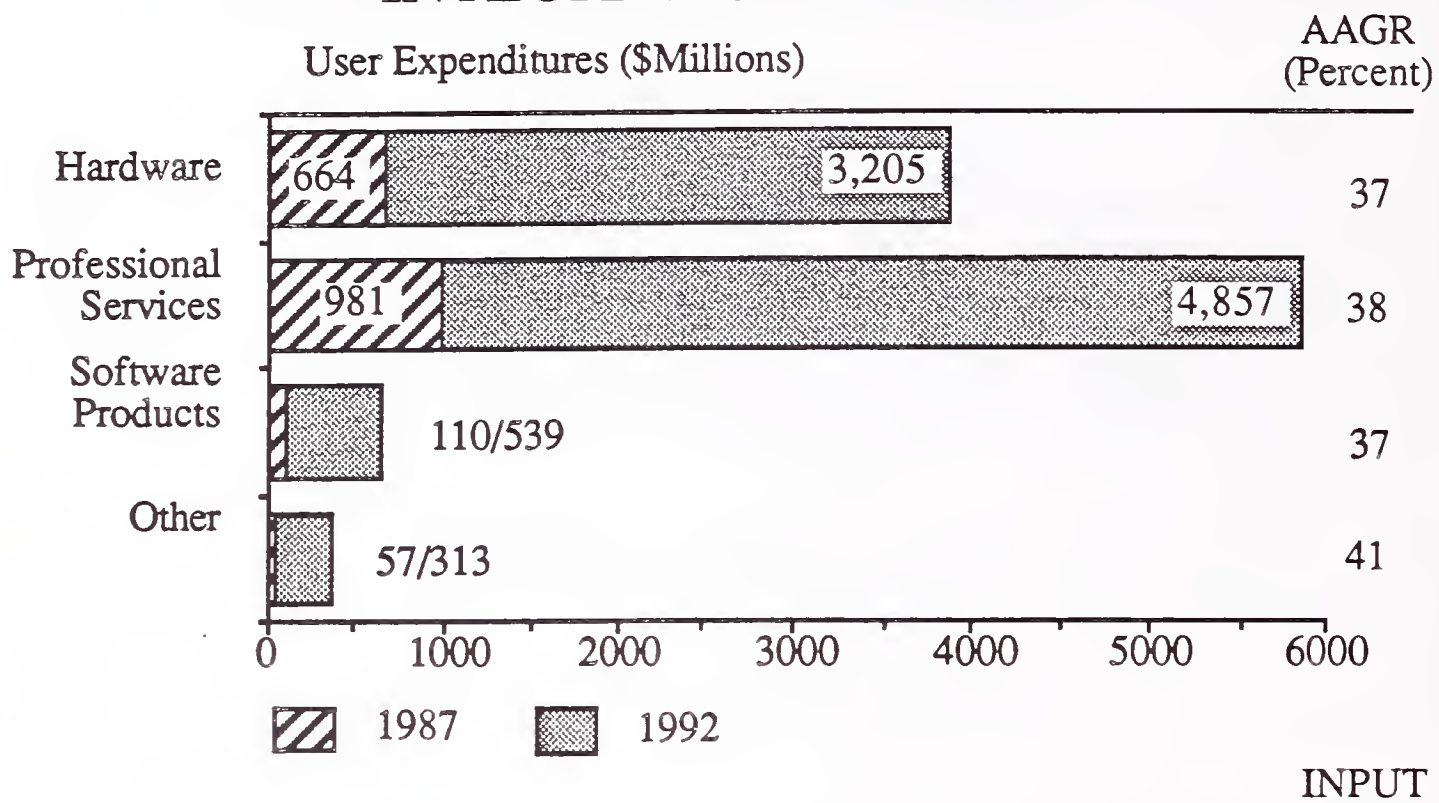
U.S. SYSTEMS INTEGRATION MARKETS



NOTES:

MPRE-133

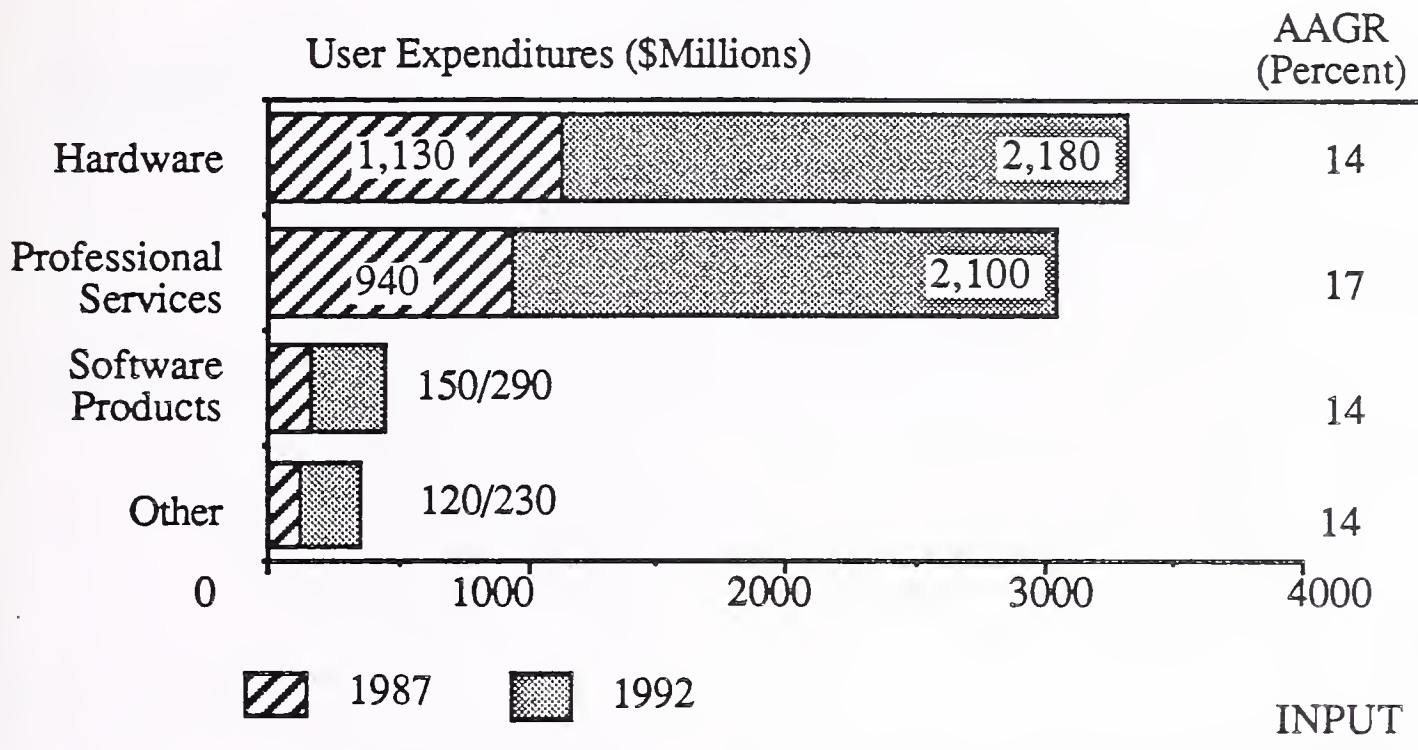
COMMERCIAL SYSTEMS INTEGRATION MARKETS



NOTES:

MPRE-134

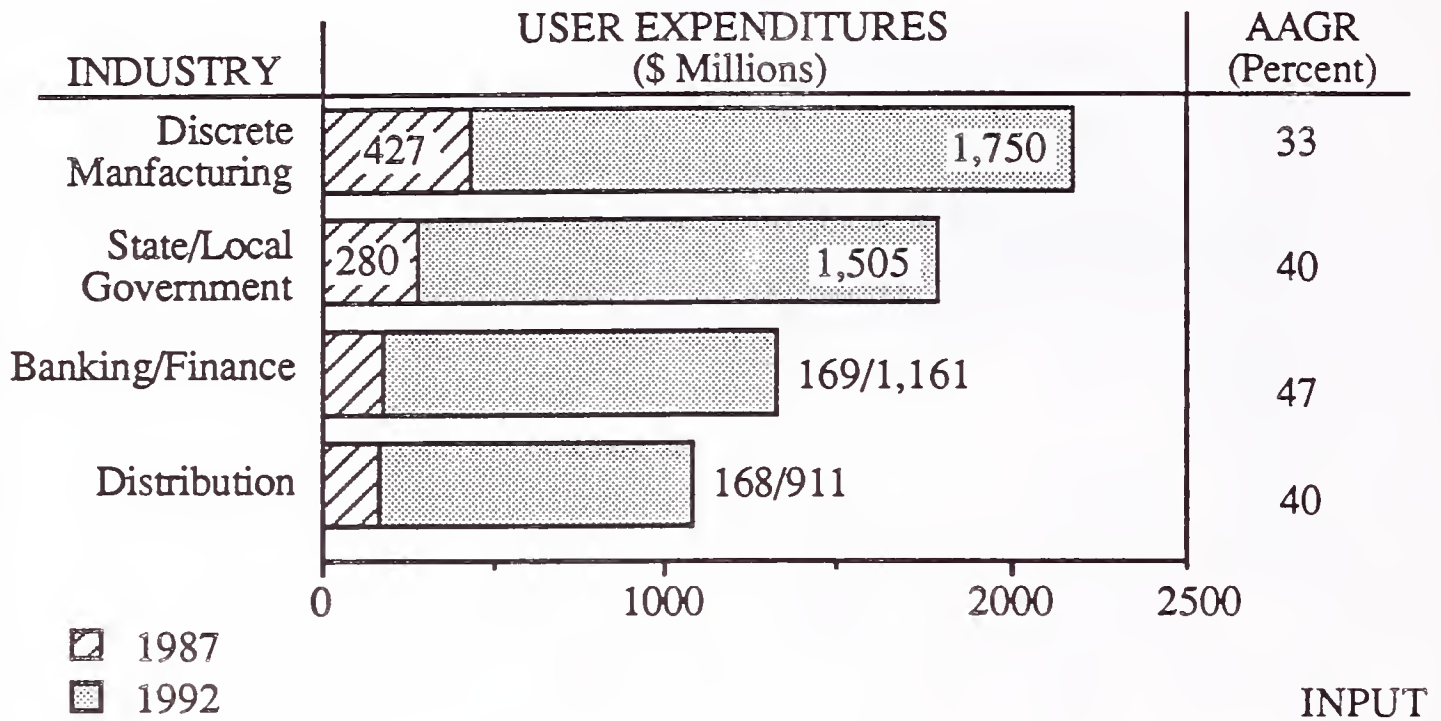
FEDERAL SYSTEMS INTEGRATION MARKETS



NOTES:

MPRE-135

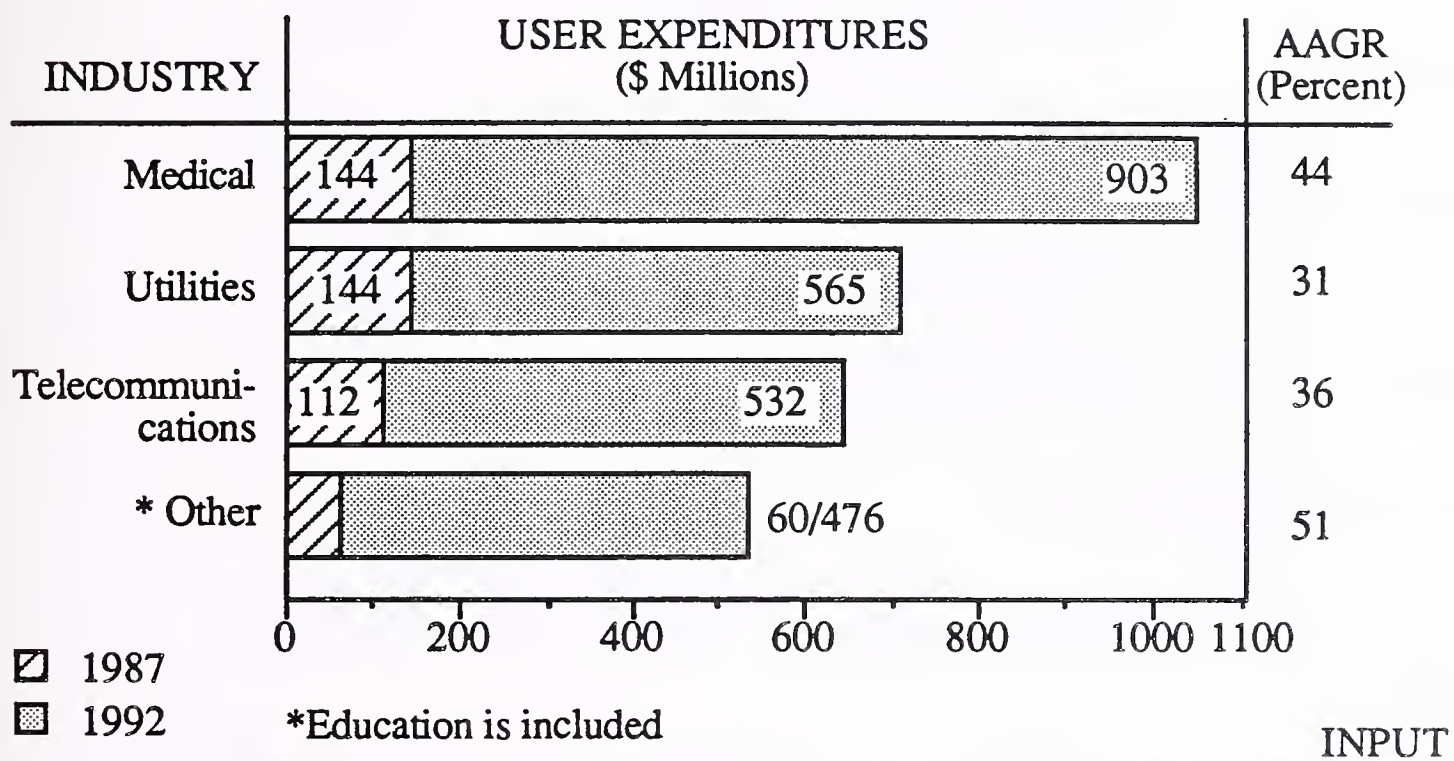
CSI EXPENDITURES BY INDUSTRY SECTOR 1987 - 1992



NOTES:

MPRE-270a

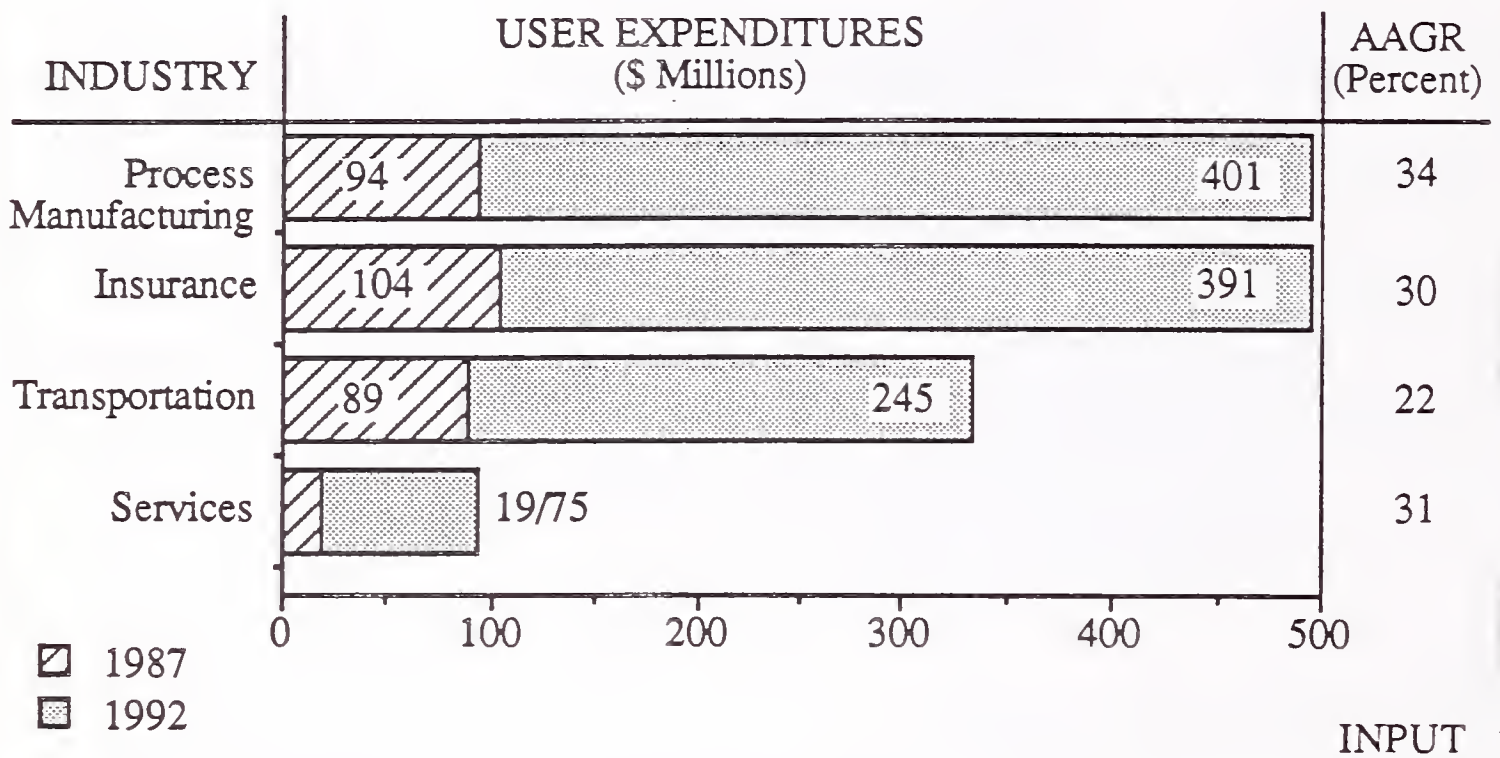
CSI EXPENDITURES BY INDUSTRY SECTOR 1987 - 1992 (Cont.)



NOTES:

MPRE-270b

CSI EXPENDITURES BY INDUSTRY SECTOR 1987 - 1992 (Cont.)



NOTES:

MPRE-270c

SYSTEMS INTEGRATION CHARACTERISTICS (FUTURE)

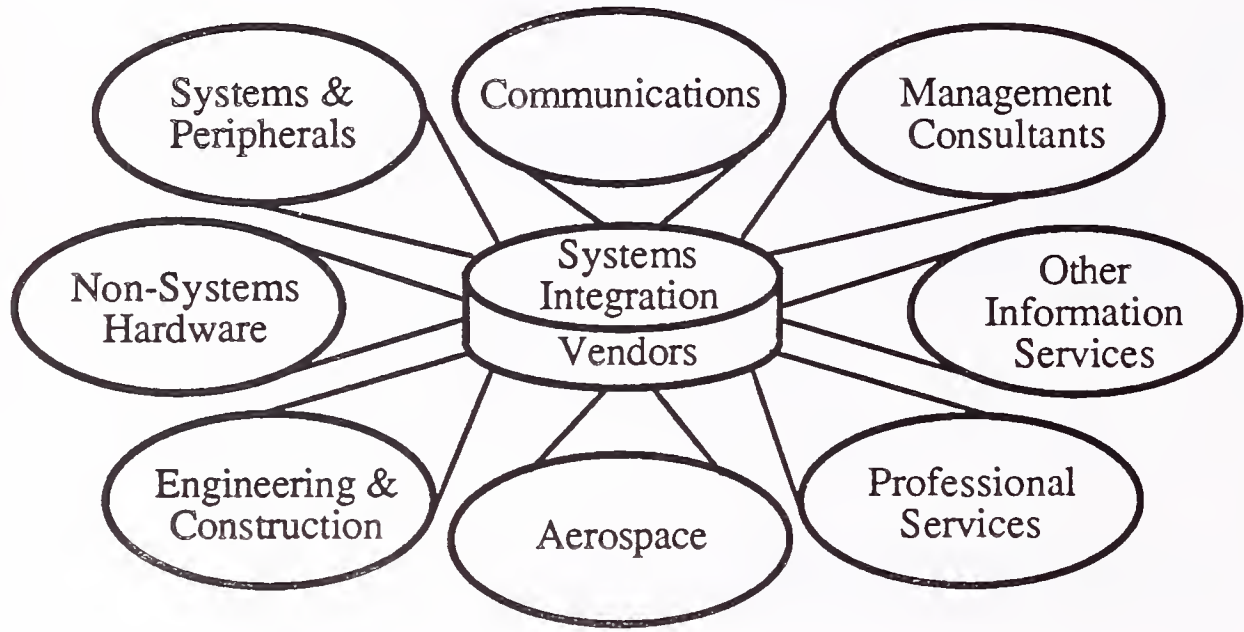
- Leading Edge Process Knowledge/Innovation
- Network Integration
- International Scope
- Financing
- Performance Guarantees
- Industry Knowledge/Track Record

INPUT

NOTES:

MPRE-136

ALLIANCES AND COMPETITIVE OVERLAP



INPUT

NOTES:

MPRE-137

IMPACT OF INTEGRATION ON INFORMATION SERVICES

- Increasing Overlap of:
 - Products/Services
 - Competitors
 - Market Targets
- Opportunity to Broaden Company Mission,
Redefine Role and Alliances

INPUT

NOTES:

MPRE-138

IMPACT OF INTEGRATION ON NETWORKS

- Increased Network I.Q.
- Improves Real Time Business Support
- Voice/Data/Text/Image Integration
- Software Driven Market Emphasis
- Technology Demand: ISDN, SS7, T-1, T-3

INPUT

NOTES:

MPRE-139

NETWORK
INTEGRATION

INPUT

NOTES:

MPRE-140

INPUT

NETWORK INTEGRATION

INFORMATION TYPES	INTEGRATION METHODS
<input type="checkbox"/> Voice <input type="checkbox"/> Data - Numbers - Text <input type="checkbox"/> Graphics - Fax <input type="checkbox"/> Image - Video	<input type="checkbox"/> Special Equipment (e.g. Multiplexers and T1 Switches) <input type="checkbox"/> PBX and Public/Private Networks <input type="checkbox"/> Value Added Networks

What to Integrate? How? By Who?

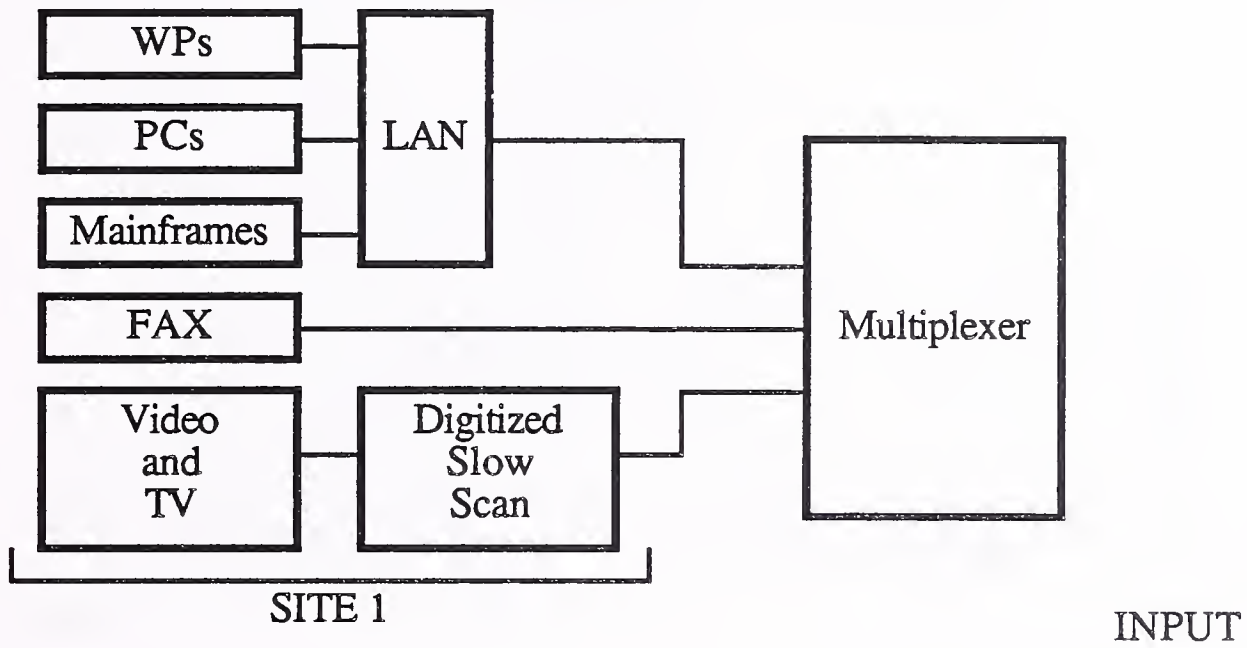
INPUT

NOTES:

MPRE-141

INPUT

INTEGRATION BY MULTIPLEXER
AND T1 SWITCH

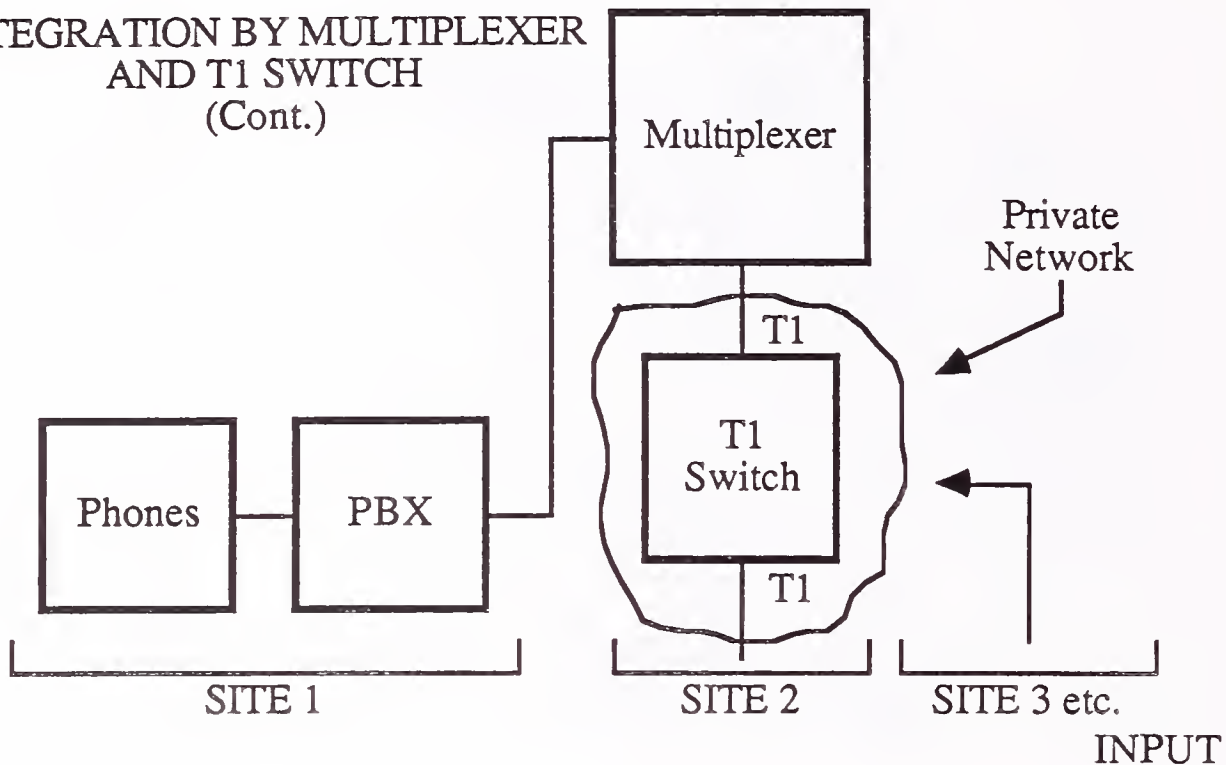


NOTES:

MPRE-142A

INPUT

INTEGRATION BY MULTIPLEXER
AND T1 SWITCH
(Cont.)

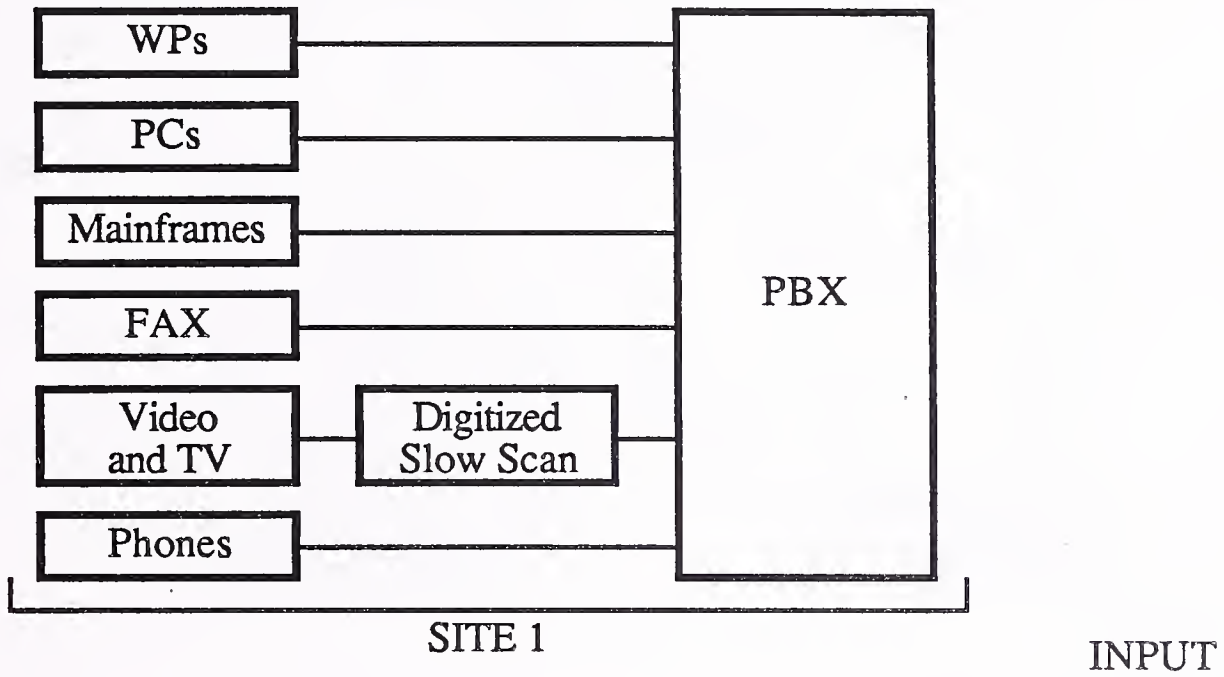


NOTES:

MPRE-142B

INPUT

INTEGRATION BY PBX AND PUBLIC/PRIVATE NETWORK

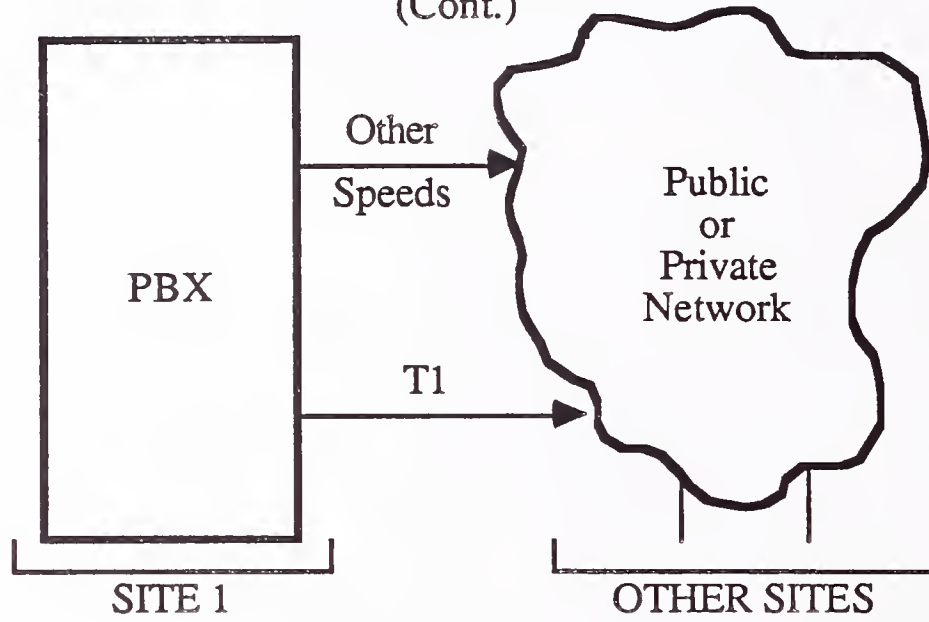


NOTES:

MPRE-143A

INPUT

INTEGRATION BY PBX AND PUBLIC/PRIVATE NETWORK
(Cont.)



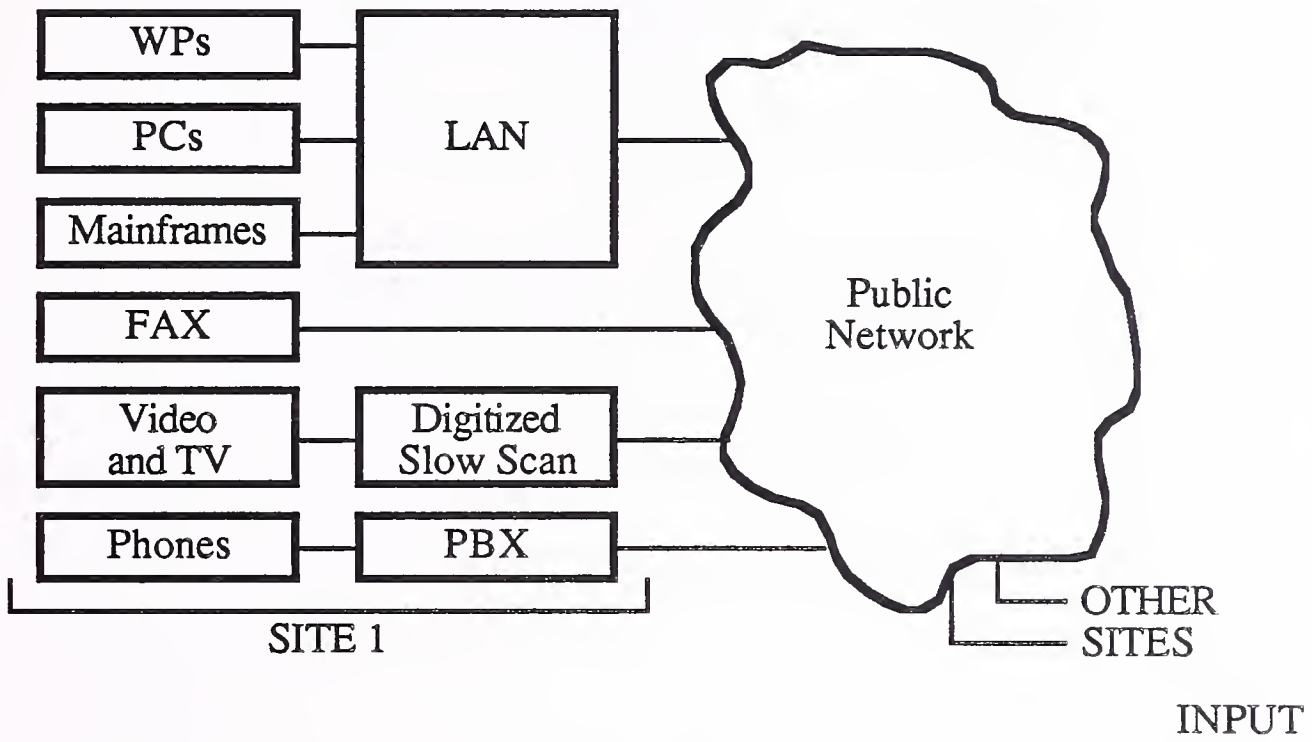
INPUT

NOTES:

MPRE-143B

INPUT

INTEGRATION BY A PUBLIC NETWORK



NOTES:

USERS ARE ACTING NOW

- Knowledgeable
- Implementing Now
 - 25% of Fortune 100s
 - 10% of Fortune 500s

INPUT

NOTES:

MPRE-145A

INPUT

USERS ARE ACTING NOW (Cont.)

- Implementing by 1992
 - 90% of Fortune 100s
 - 50% of Fortune 500s

- 25% of a Company's Sites Will Be Integrated

INPUT

NOTES:

MPRE-145B

INPUT

BENEFITS AND COST SAVINGS ARE DRIVING USERS

- Only Few Users Use Cost Only
- Benefits to the Corporation are of Greatest Importance
 - Better Decisions
 - Better Customer Interaction

INPUT

NOTES:

MPRE-146A

INPUT

BENEFITS AND COST SAVINGS ARE DRIVING USERS (Cont.)

- Cost Benefit Mixture
 - Hold the Line on Costs
 - Use Savings to Pay for New Applications

INPUT

NOTES:

MPRE-146B

INPUT

USERS WANT PERFORMANCE AND GOOD TREATMENT

- Performance
 - Promises
 - Reliability
 - Technology
 - Standards

INPUT

NOTES:

MPRE-147A

INPUT

USERS WANT PERFORMANCE AND GOOD TREATMENT (Cont.)

- Treatment
 - Users Are Also Knowledgeable
 - Help With Divisions

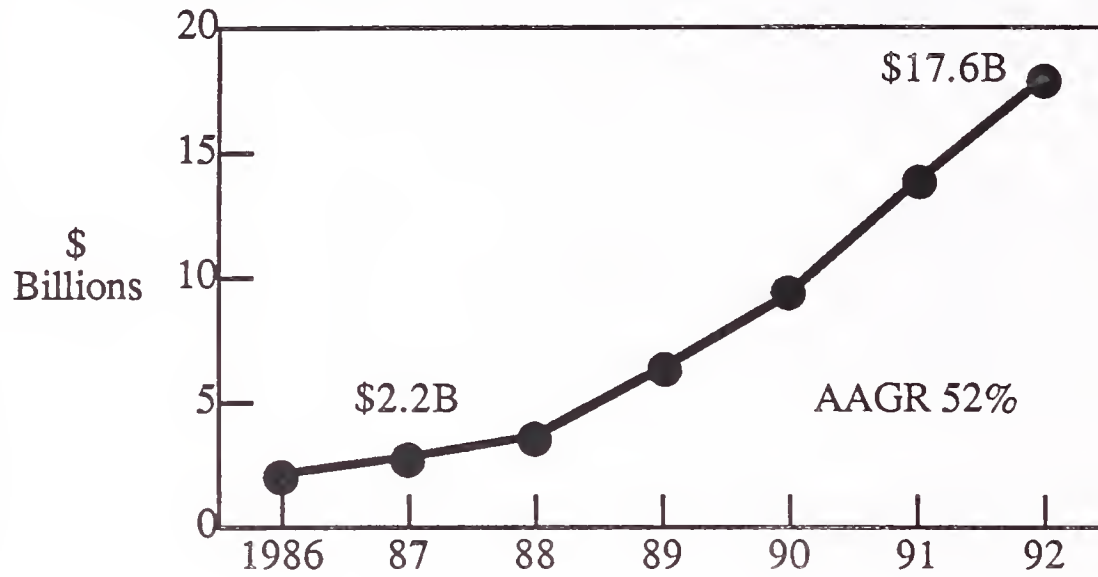
INPUT

NOTES:

MPRE-147B

INPUT

THE MARKET IS GROWING RAPIDLY



INPUT

NOTES:

MPRE-148

INPUT

RECOMMENDATIONS TO VENDORS

- Flexibility
- Cost Benefits
 - Hard Dollars
 - Soft Dollars

INPUT

NOTES:

MPRE-149A

INPUT

RECOMMENDATIONS TO VENDORS (Cont.)

- Try to Help with Divisions
 - Real Need
 - Ally with Telecommunications Manager

INPUT

NOTES:

MPRE-149B

INPUT

VENDOR STRUCTURING STRATEGIES

- Establish Influential Relationships with Top Management
- Engender a "Full Service" Image
- Develop and Promote Proprietary Technology
- Develop Project Management Capabilities, Techniques
- Implement Mechanisms to Leverage all Resources
- Identify Required Skill Sets, Staff Organization

INPUT

NOTES:

MPRE-155

INPUT

IMPACT OF INTEGRATION ON HARDWARE PRODUCTS

- Continuous Increase in Component/
Subsystem Functionality
- Greater Redundancy Sought
- Customer Service Costs Are Hardware Driven
- Hardware Absorbing System Software

INPUT

NOTES:

MPRE-150

IMPACT OF INTEGRATION ON BUSINESS PROCESSES

- Drives Restructuring of:
 - Organization
 - Job Content
 - Procedures
- Determines Competitive Advantage
- Requires Leveraging of Information Assets

INPUT

NOTES:

MPRE-151

CSI
IMPLEMENTATIONS
(Case Studies)

INPUT

NOTES:

MPRE-152

INPUT

FORCES IN SELECTING A CSI APPROACH

- Expertise is Limited or Experiences Negative
- Single-Source Solution is Preferred
- Vendor "Partners" are Desired
- Solution is Not Pre-Conceived
- Consultant Recommends It

INPUT

NOTES:

MPRE-153

INPUT

CSI VENDOR SELECTION CRITERIA

FACTOR	WEIGHT (Percent)
Technical Credibility of the Solution	40
Risk Avoidance	30
- Experience/Capabilities	10
- Project Management Approach	10
Cost	20
Service Orientation	Not Scored

INPUT

NOTES:

MPRE-154

INPUT

USER NEEDS VERSUS VENDOR SOLUTIONS

USER NEEDS	VENDOR SOLUTIONS
Unique Solutions	"Customized" Packages
Successful Project Progress	Methods and Tools Not Displayed
Vendor Alliances	"We'll Do It All" Approach

INPUT

NOTES:

MPRE-156

INPUT

RECOMMENDATIONS

- Commit to Early Start and Long Pre-Award Investment
- Assess Project Opportunities Carefully
- Bid Responsively to Explicit AND Implicit Specifications
- Leverage ALL Corporate Capabilities

INPUT

NOTES:

MPRE-157

INPU

PRE-RFP WORK IS REQUIRED

- Get in Early on...
 - Consultant/Company Relationship Building
 - Understanding of Culture, Requirements
 - Pre-Qualification Demonstration

INPUT

NOTES:

MPRE-158A

INPUT

PRE-RFP WORK IS REQUIRED (Cont.)

- Assess Project Carefully
 - Is It "Real"?
 - Can It Be Done?
 - Will It Be Worth the Investment?
 - Is This Our Kind of Business?

INPUT

NOTES:

MPRE-158B

INPUT

BID MUST BE RESPONSIVE TO...

- Basic, Required Terms and Conditions
- Implicit and Expicit Specifications
(Meet Needs, Don't Sell Products)
- Concern for Financial Strength
(Small Vendors Need Brokers)

INPUT

NOTES:

MPRE-159A

INPUT

BID MUST BE RESPONSIVE TO...
(Cont.)

- Desire for Well-Defined Change Control Process
- Need for Assurances of Dedicated Resources
- Positive Feeling for "Freebees"

INPUT

NOTES:

MPRE-159B

INPUT

RISK AVERSION REQUIRES...

- Financial Investment
 - Facilities
 - Tools
 - Personnel
 - Sales/Marketing

INPUT

NOTES:

MPRE-160A

INPUT

RISK AVERSION REQUIRES... (Cont.)

- Corporate Commitment
 - Rapid Decisionmaking
 - Leverage All Personnel
 - Standards for Business Practices

INPUT

NOTES:

MPRE-160B

INPUT

CASE STUDY #2:

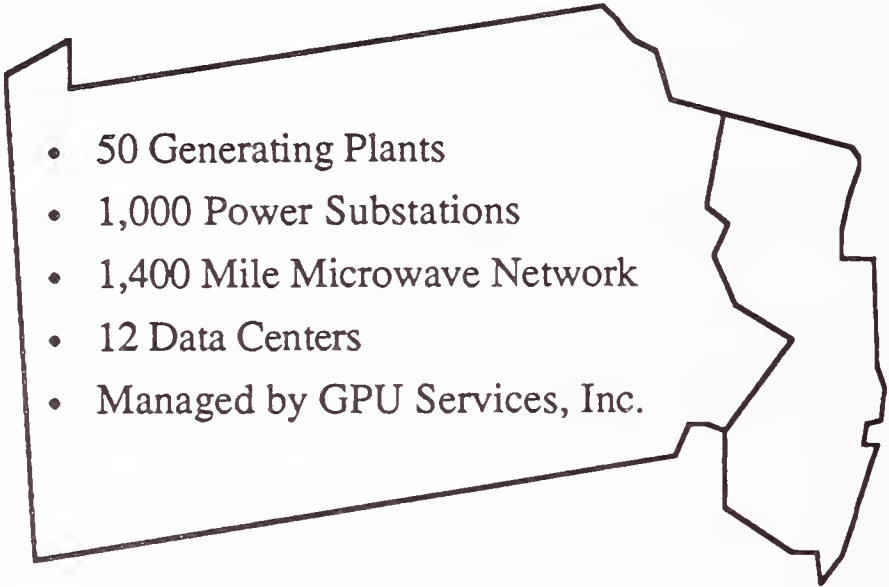
GPU
GENERAL PUBLIC UTILITIES

INPUT

NOTES:

MPRE-170

CURRENT ENERGY MANAGEMENT SYSTEM

- 
- 50 Generating Plants
 - 1,000 Power Substations
 - 1,400 Mile Microwave Network
 - 12 Data Centers
 - Managed by GPU Services, Inc.

INPUT

NOTES:

MPRE-171

PROBLEM

- Obsolete EMS
 - Vendor (Xerox) Out of Business
 - Time and Space Restrictions
 - Difficult to Maintain
- Heavily Patched General Purpose Applications

INPUT

NOTES:

MPRE-172

SCOPE OF WORK

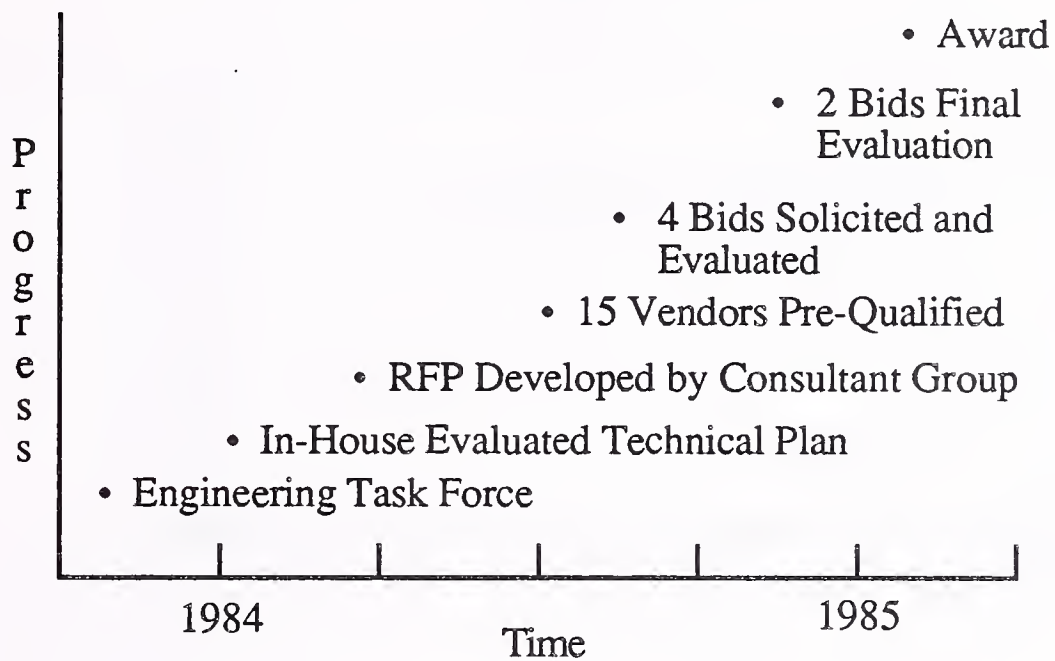
- Manage Entire Project
- Replace Current Hardware
- Consolidate to Four Sites
- Rewrite EMS
- Develop Portable Applications Software
- Increase Inter-Processor Communications
- Five-Year Maintenance

INPUT

NOTES:

MPRE-173

STEPS TO AWARD



INPUT

NOTES:

MPRE-174

BIDDERS

- Control Data Corporation (CDC)
- Ferranti International
- SCI
- Stagg Systems

INPUT

NOTES:

MPRE-175

EVALUATION CRITERIA

- Expertise in EMS
- Revenue Size in Proportion to Project Size
- General Processor Capabilities
- Ability to Develop Business Applications
- Size of Processor
- System Back-Up Plan

INPUT

NOTES:

MPRE-176

AWARD

CONTROL DATA

Energy Management Systems Division

- \$32 Million Over Five Years
- Five One-Year Maintenance Contracts

INPUT

NOTES:

MPRE-177

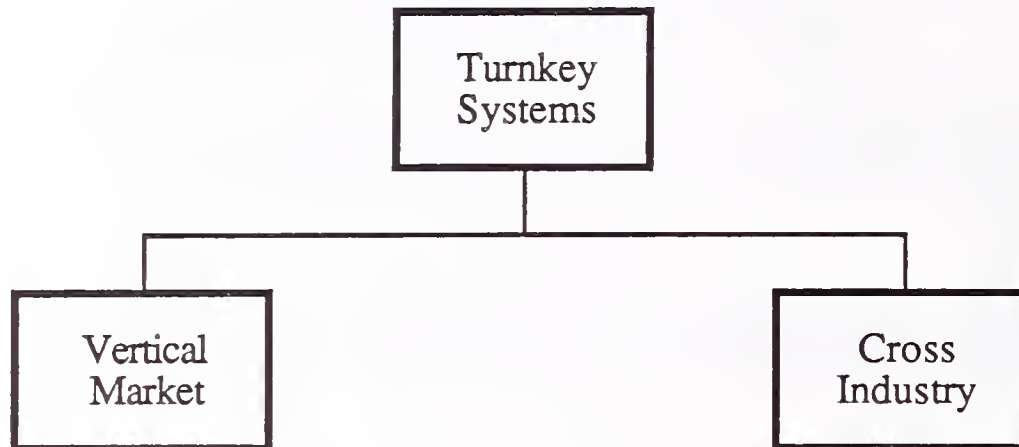
TURNKEY SYSTEMS

INPUT

NOTES:

MPRE-181

TURNKEY SYSTEMS MARKET STRUCTURE

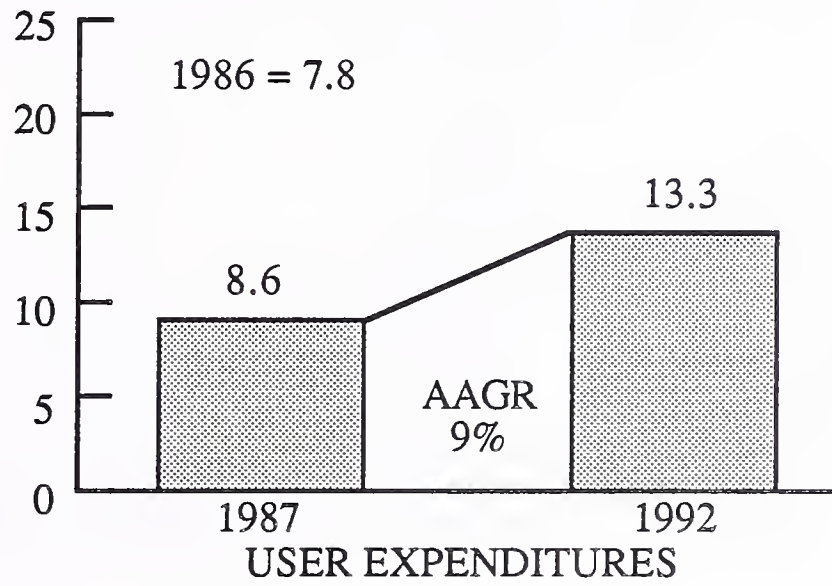


INPUT

NOTES:

MPRE-182

TURNKEY SYSTEMS MARKET (\$ Billions)

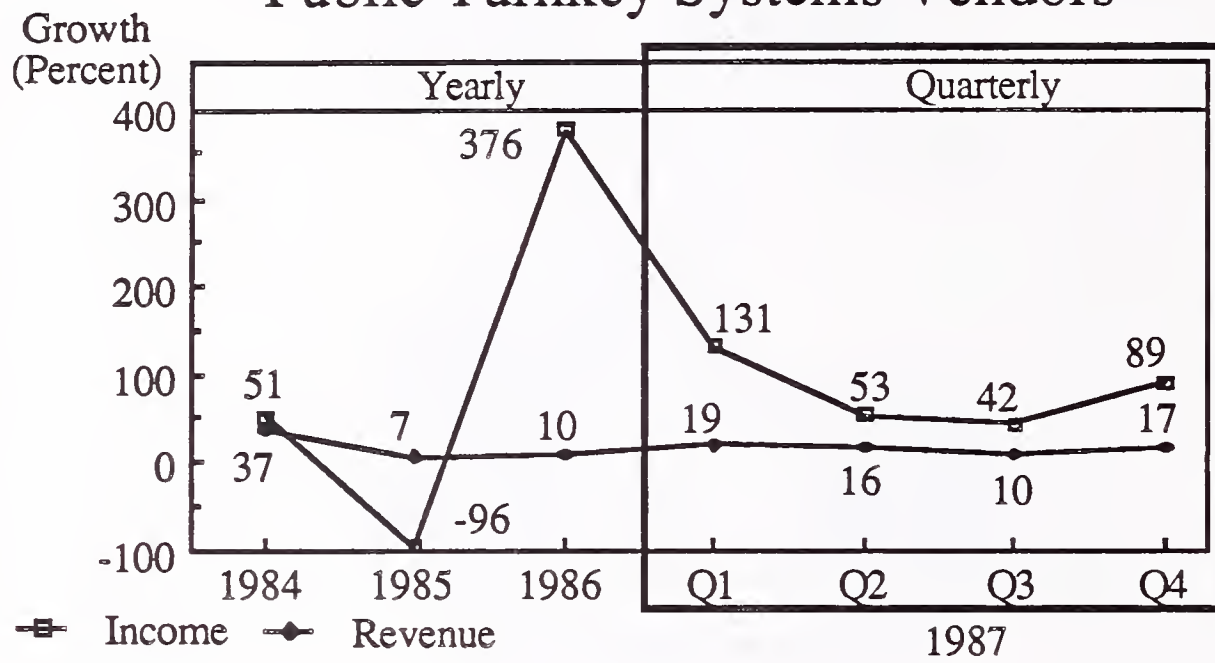


INPUT

NOTES:

MPRE-183

Public Turnkey Systems Vendors

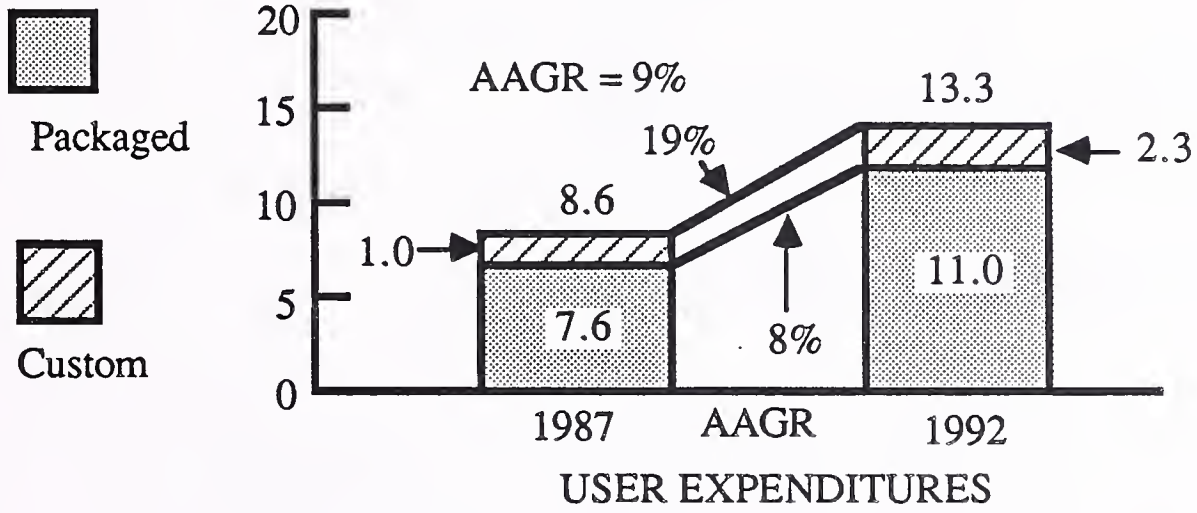


INPUT

NOTES:

MVFW Q4 MPRE-184

CUSTOM VS. PACKAGED TURNKEY SYSTEMS MARKET, 1987-1992 (\$ BILLIONS)



INPUT

NOTES:

MPRE-185

TURNKEY SYSTEM VENDOR FOCUS

- More Focus and Purpose Required
- VARs Need to Solve Business Problems
- Special Circumstances Exist Providing Vertical Opportunity for Hardware Vendors

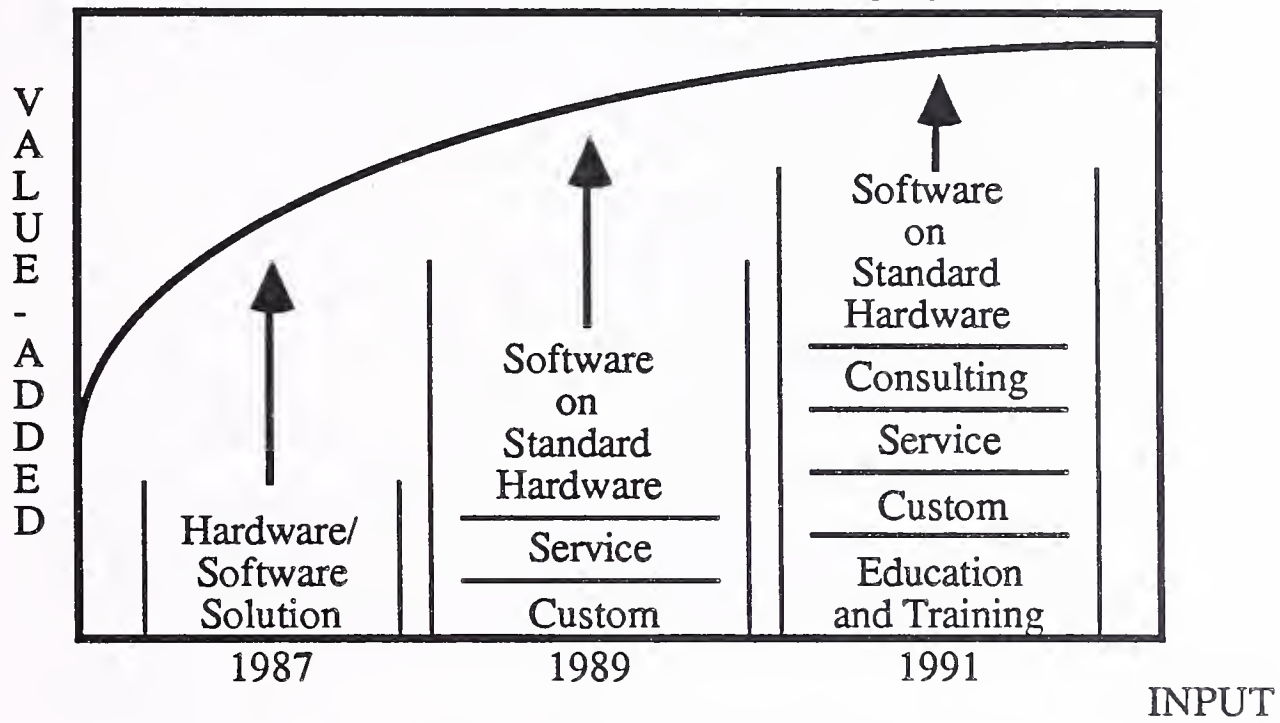
INPUT

NOTES:

MPRE-186

INPUT

VALUE-ADDED SERVICES IN THE FUTURE



NOTES:

RECOMMENDATIONS

- "Mine" the Installed Base
- Develop New Services
- Focus on Industry-Specific Niche
- Discover Hardware Platforms with Life-Cycle View
- Develop Service Orientation
- Initiate Consulting Capabilities

INPUT

NOTES:

MPRE-188

INPUT

LEADING TURNKEY SYSTEMS VENDORS
U.S. REVENUES-1986

COMPANY NAME	REVENUE (\$ Millions)	MARKET SHARE (Percent)
Intergraph	400	5
Reynolds & Reynolds	220	3
McDonnell Douglas	218	3
GE CALMA	180	2

INPUT

NOTES:

MPRE-189A

INPUT

LEADING TURNKEY SYSTEMS VENDORS
U.S. REVENUES-1986 (Cont.)

COMPANY NAME	REVENUE (\$ Millions)	MARKET SHARE (Percent)
National Computer Sys.	161	2
ISC Systems	154	2
Ultimate*	138	2

*Ultimate provides a computer system for its
VAR distribution channel and is a VAR itself.

INPUT

NOTES:

MPRE-189B

LEADING TURNKEY SYSTEMS VENDORS
U.S. REVENUES-1986 (Cont.)

COMPANY NAME	REVENUE (\$ Millions)	MARKET SHARE (Percent)
Gerber Scientific	130	2
Computervision	122	1
Convergent	110	1
Triad	109	1

INPUT

NOTES:

MPRE-189C

INPUT

TURNKEY SYSTEMS FAST-GROWING VENDORS - 1986

	<u>Revenue (\$ Millions)</u>	<u>85-86 Growth (Percent)</u>
Interleaf	25	287
Landmark Graphics	14	200
Barondata	42	133
Teradata	35	100
Computrac	10	61

INPUT

NOTES:

MPRE-190

TURNKEY SYSTEMS: DRIVING FORCES

- Saturation Phase
 - Tough Market
 - Cost of Customization
 - Growth Slowing
- Hardware Vendors Providing Solutions
- Customizing Potential
- Hardware Profit Contribution Decreasing
- Hardware Vendors Competing on Hardware Portion

INPUT

NOTES:

MPRE-192

VAR ADVANTAGES

- Application/Industry Knowledge
- Local Accessibility
- Responsiveness
- Leading-Edge Packaging
- Personal Involvement

INPUT

NOTES:

MPRE-193

INPUT

VAR DISADVANTAGES (LACK OF)

- National or Multi-Locations
- Financial Resources
- Applications Breadth
- Support/Maintenance
(Geographical)

INPUT

NOTES:

MPRE-194

INPUT

SPECIAL TURNKEY SYSTEMS VENDORS

COMPANY	CHARACTERISTIC	1986 REVENUE (\$ Millions)
Ultimate	Provides Hardware with PICK-OS	138
Convergent	Hardware Vendor Acquired Several Turnkey Vendors	110
Altos	No Direct Sales People	-

INPUT

NOTES:

MPRE-195A

INPUT

**SPECIAL TURNKEY SYSTEMS VENDORS
(Cont.)**

COMPANY	CHARACTERISTIC	1986 REVENUE (\$ Millions)
IBM	SolutionPacs	NM
DEC	SystemsSolutions	NM
Intergraph	Largest Turnkey Vendor Goes Proprietary	400

INPUT

NOTES:

MPRE-195B

INPUT

WESTERN EUROPE

Information Services Industry Outlook

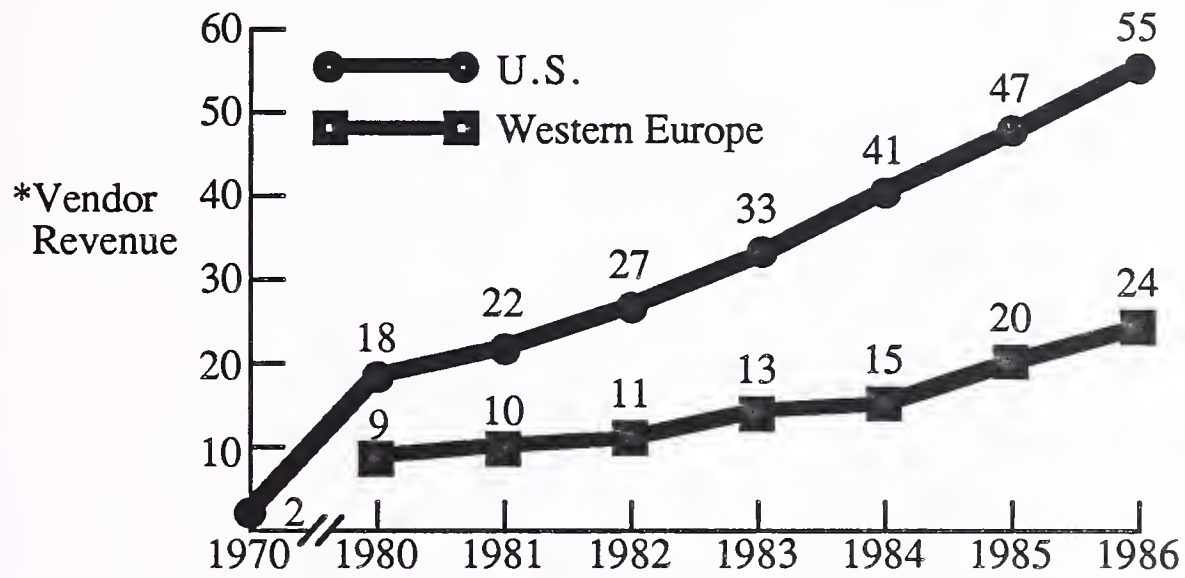
INPUT

NOTES:

MPRE-201.5

REVENUE GROWTH IN THE INFORMATION SERVICES INDUSTRY, 1970-1986

(\$ Billions)



*Note: Definition changes have slightly affected gross market sizes on a year-to-year basis.

INPUT

NOTES:

MPRE-202

LEADING EUROPEAN VENDORS INFORMATION SERVICES

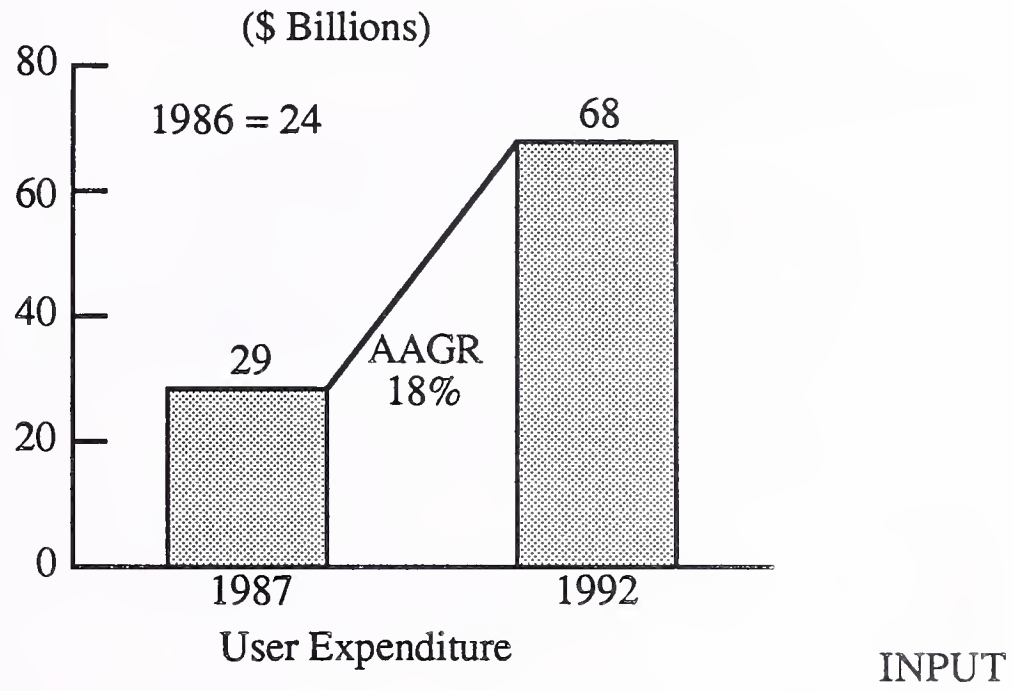
	\$Millions 1986
CAP GEMINI SOGETI	\$423
SCICON	254
CISI	219
SEMA-METRA	204
GSI	190
DATEV	187
THORN-EMI	150

INPUT

NOTES:

MPRE-203

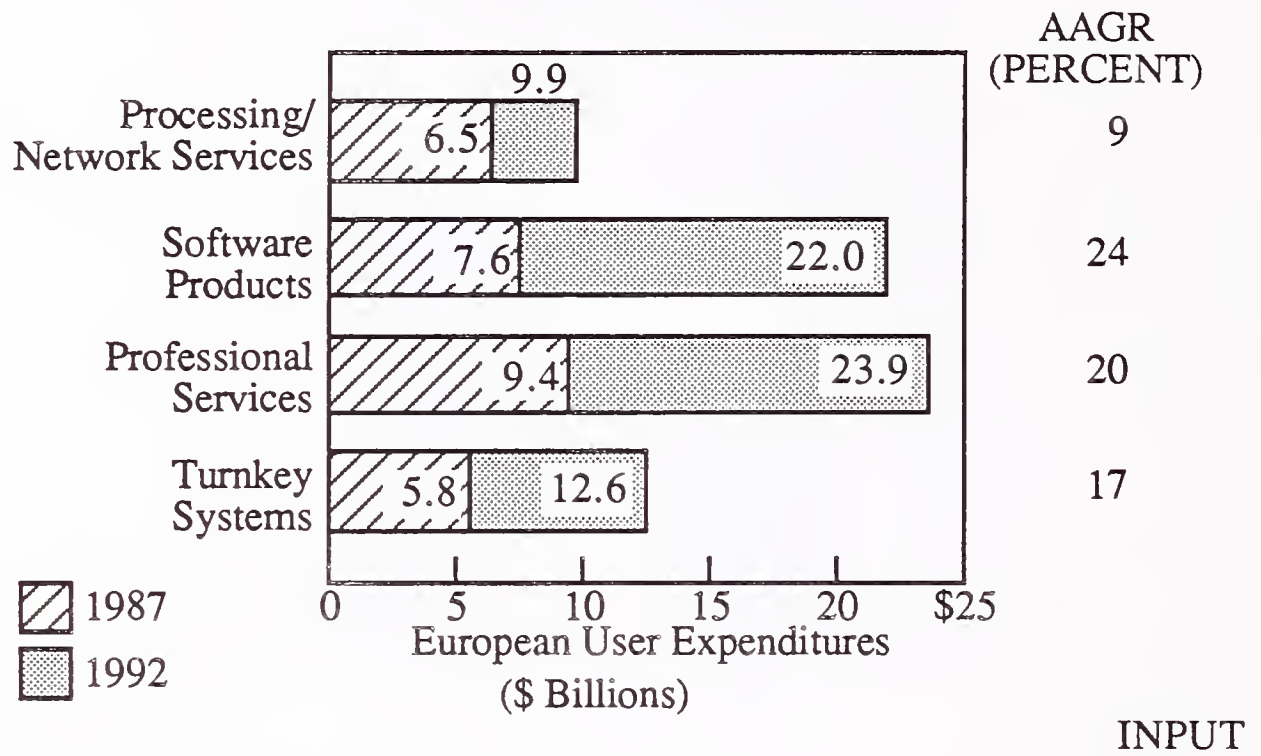
INFORMATION SERVICES MARKET - EUROPE



NOTES:

MPRE-204

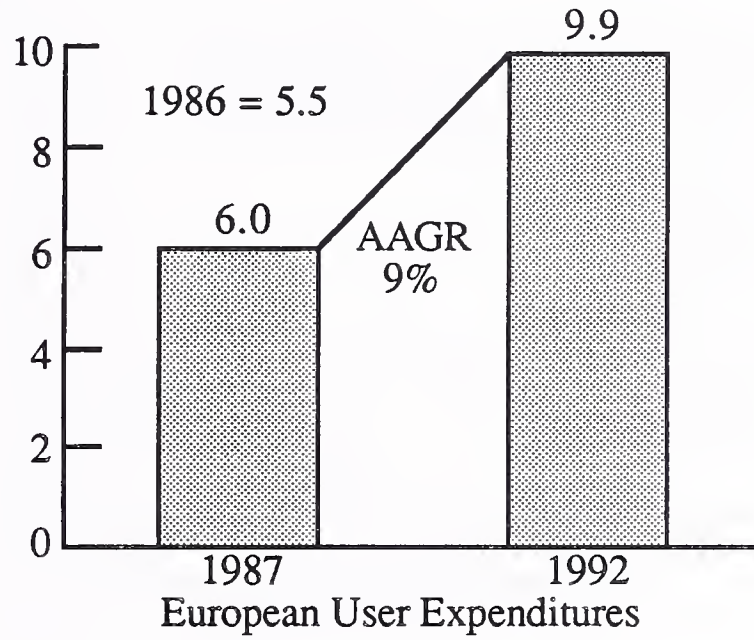
INFORMATION SERVICES INDUSTRY BY DELIVERY MODE



NOTES:

MPRE-205

PROCESSING/NETWORK SERVICES MARKET (\$ Billions)

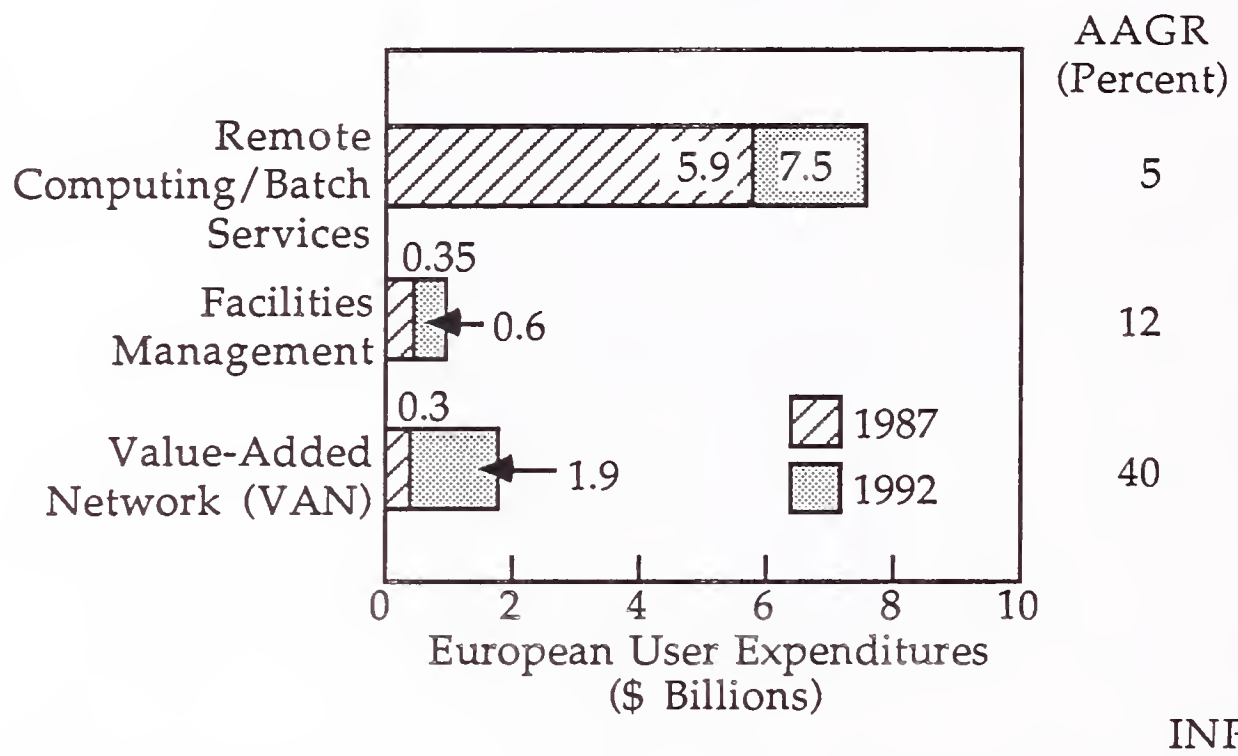


INPUT

NOTES:

MPRE-206

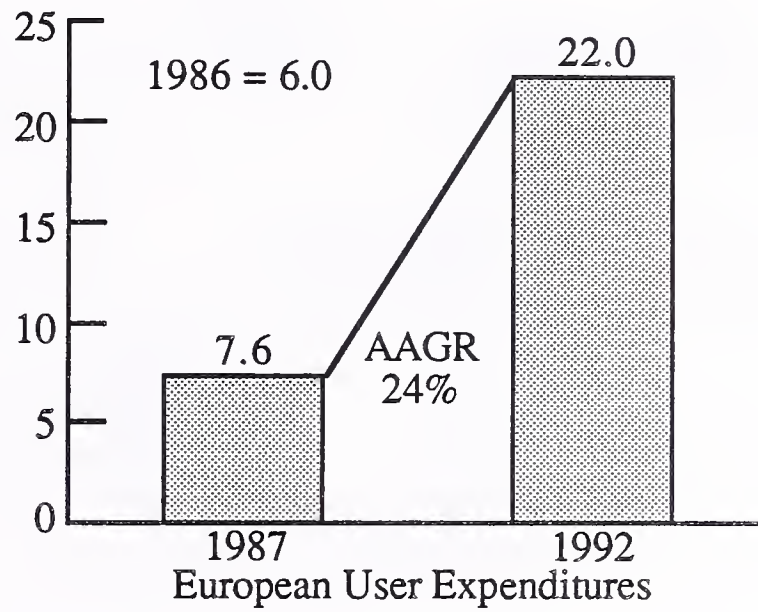
PROCESSING/NETWORK SERVICES MARKETS 1987-1992



NOTES:

MPRE-207

SOFTWARE PRODUCTS MARKET (\$Billions)

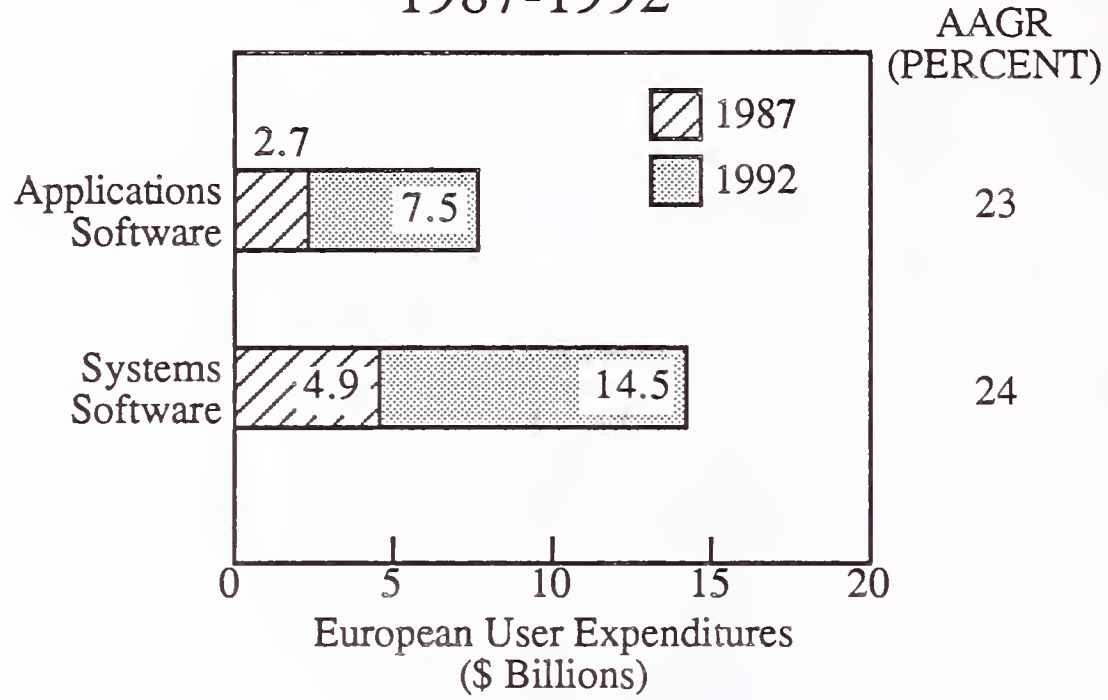


INPUT

NOTES:

MPRE-208

SOFTWARE PRODUCTS MARKETS 1987-1992

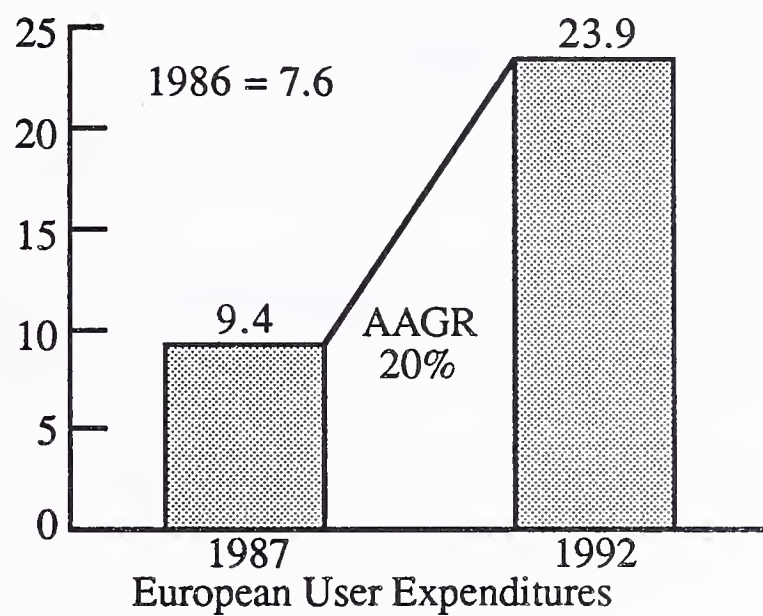


INPUT

NOTES:

MPRE-209

PROFESSIONAL SERVICES MARKET (\$ Billions)

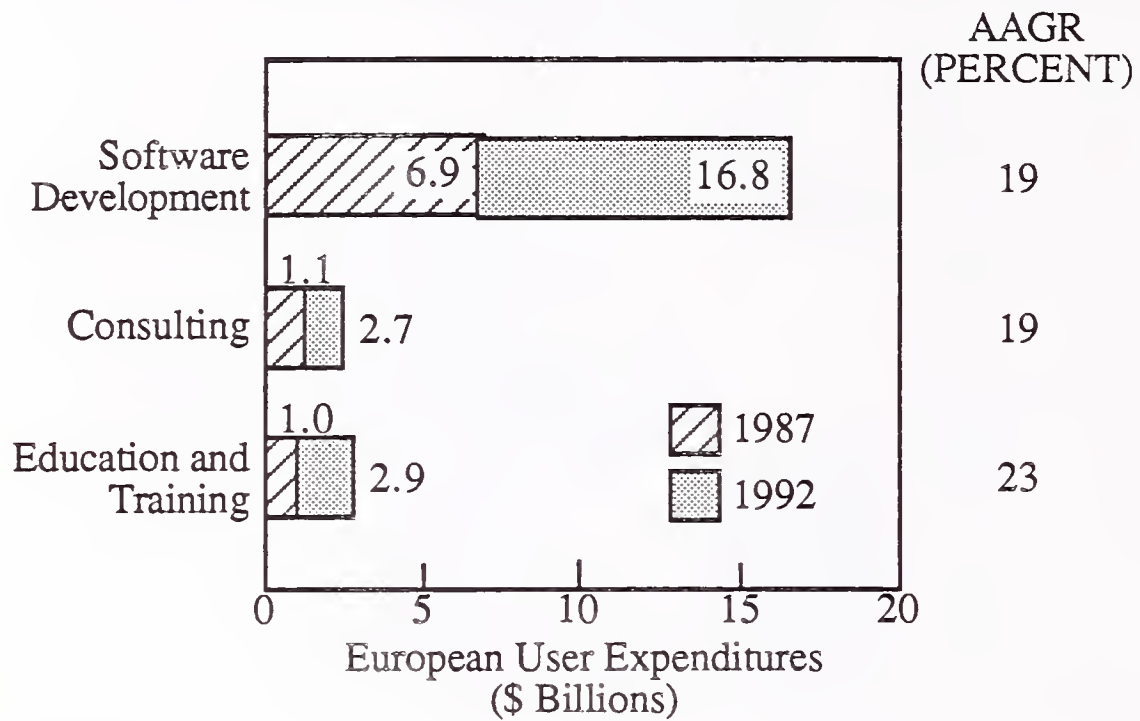


INPUT

NOTES:

MPRE-210

PROFESSIONAL SERVICES MARKET BY MODE, 1987-1992

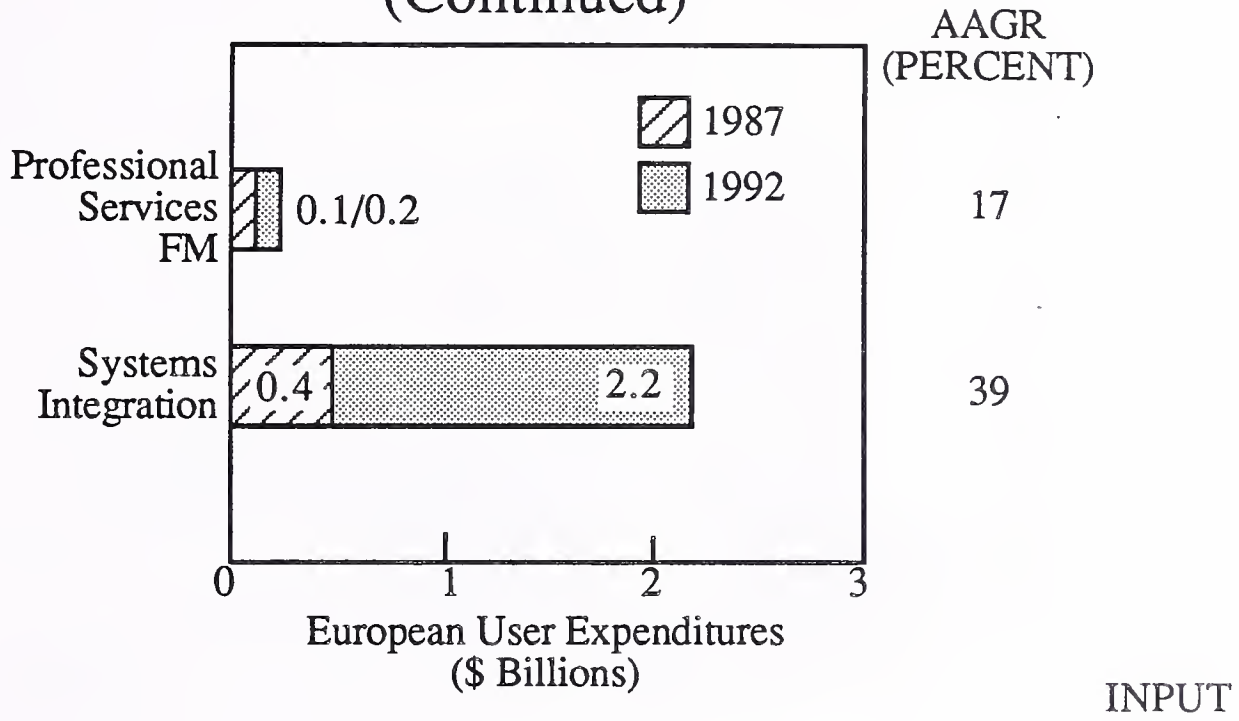


INPUT

NOTES:

MPRE-211

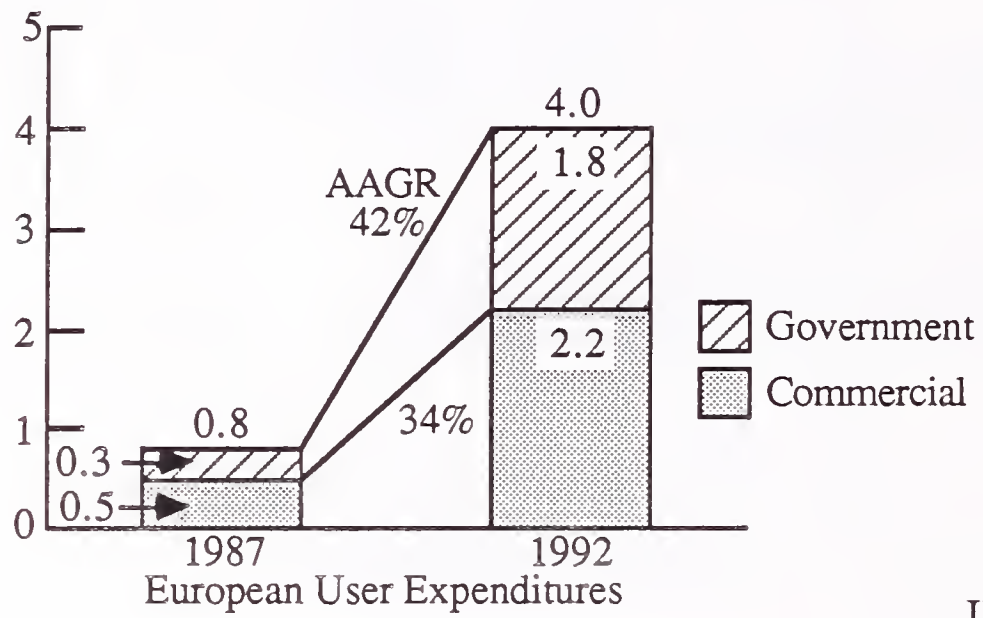
PROFESSIONAL SERVICES MARKET BY MODE, 1987-1992 (Continued)



NOTES:

MPRE-212

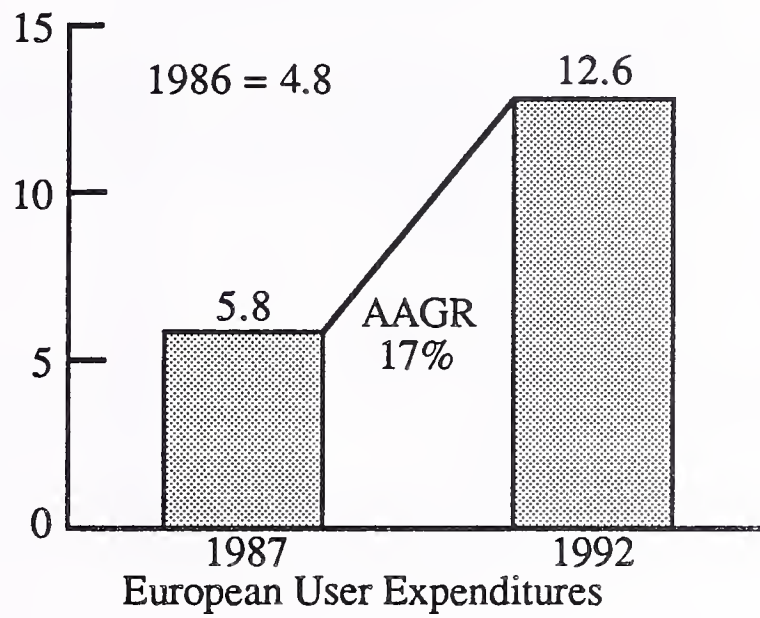
SYSTEM INTEGRATION MARKET, 1987-1992 (\$ Billions)



NOTES:

MPRE-213

STANDARD TURNKEY SYSTEMS MARKET, 1987-1992 (\$ Billions)



INPUT

NOTES:

MPRE-214

LARGEST STANDARD
TURNKEY SYSTEMS VENDORS -
EUROPEAN MARKET

1. Computervision
2. Intergraph
3. Applicon
4. Calma
5. Racal-Redac
6. SESA
7. Sligos
8. Metier

INPUT

NOTES:

MPRE-215

SUMMARY COMMENTS AND CONCLUSIONS

INPUT

NOTES:

MPRE-196

KEY QUESTIONS

- Processing Services
 - Is RCS Viable?
- Software Products
 - How Much Do You Customize?
- Professional Services
 - Are Core Products Necessary?
- Turnkey Systems
 - Continue to Sell Hardware?

INPUT

NOTES:

MPRE-197

MARKET DIRECTIONS TO 1992

- Processing Services
 - Steady Growth, Consolidation and Dominance of Major Companies
 - Network and Electronic Information Services Grow More Rapidly
 - Emergence of the Consumer Market

INPUT

NOTES:

MPRE-198A

MARKET DIRECTIONS TO 1992 (Cont.)

- Software Products
 - Sustained Growth and Opportunity will be the Dominant Delivery Mode in 1988

INPUT

NOTES:

MPRE-198B

MARKET DIRECTIONS TO 1992 (Continued)

- Professional Services
 - Strong Demand for Basic Services
 - Systems Integration
- Turnkey Systems
 - Niche-Oriented, Growth Slowing

INPUT

NOTES:

MPRE-199

CONCLUSIONS

- Platforms Changing:
PS/2 Getting More Attention
- People Critical to Success
- New Application Opportunities
 - Electronic Publishing
 - CASE
 - EIS
 - Productivity-Oriented

INPUT

NOTES:

MPRE-200

CONCLUSIONS

(Continued)

- Information Services Outlook Bullish
- Technology Provides New Opportunities

INPUT

NOTES:

MPRE-201

