

INFORMATION SYSTEMS

A VENDOR POINT OF VIEW

INPUT

NOTES:

USM1-DT1-1



- Overview -
Status of the Industry

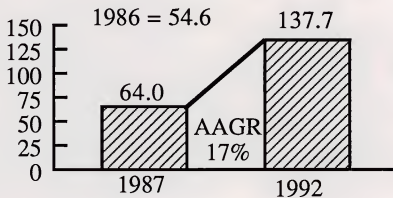
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Information Services Market (\$ Billions)



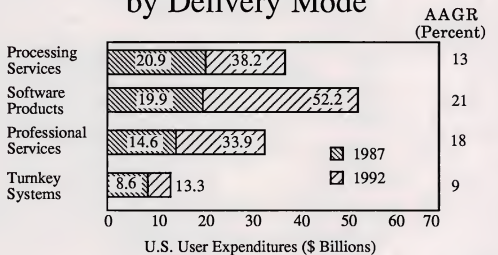
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Information Services Industry by Delivery Mode



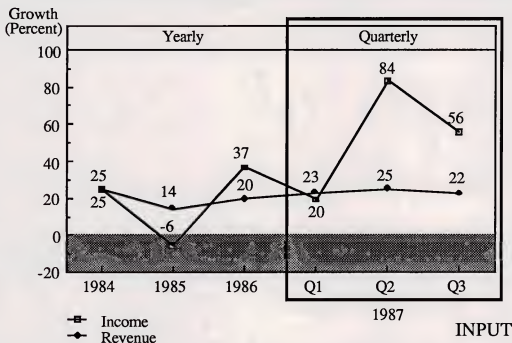
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Public Information Services Vendors



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Key Events

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

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Key Events

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

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ENVIRONMENT

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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:

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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"

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IS Manager Comments on
Economic Change
(25 Interviews)

Process Manufacturing Participant

"Recession Is Already Built into the Plan"
Re: Inflation "Don't See It Coming"

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IS Manager Comments on Economic Change (25 Interviews)

Process Manufacturing Participant

"My Business Line Is Pharmaceuticals
Which Are Terribly Immune to Recession",
"Regulatory Considerations Are Main
Budgetary Impact"

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IBM Revenue Growth

SOURCE	(Percent)			
	1983	1984	1985	1986
Sales	38.4	27.8	15.6	(0.4)
→ Services	19.4	25.1	20.1	28.0
Rentals	(17.0)	(28.7)	(37.4)	(25.5)
Total Revenue	16.9	14.3	9.0	2.4

Net of Currency Gains: (6.3)

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IBM Standards - Controlling The Environment

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

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IBM Standards - Controlling The Environment

- Token Ring LAN: Intra-Company
 Communications
- OSI: Network Design
 Normalization

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IBM Standards - Controlling The Environment

- SAA: Application Design and User Interfaces: Bringing It All Together

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IBM Status in Information Services Industry

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

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IBM Status in Information Services Industry

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

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INFORMATION
SERVICES
INDUSTRY
1987-1992

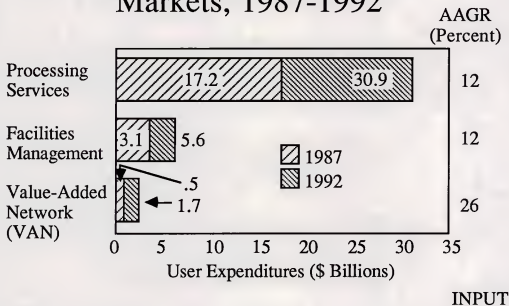
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Processing/Network Services Markets, 1987-1992



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Electronic Data Interchange

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

- Overcomes Incompatibilities
 - Standard Formats

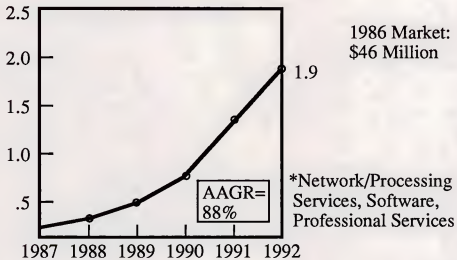
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EDI Market Forecast*



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EDI/Application Integration

- Affects Many Departments
- Top Management Needs to Set Corporate Goals
- Task Force Approach Required

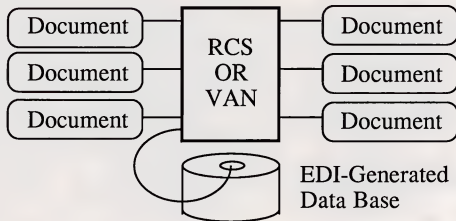
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EDI Traffic Becomes a Data Base



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EDI/Application Integration

- Professional Services Firms Can Assist
- EDI a Starting Point for Total Operational Improvements

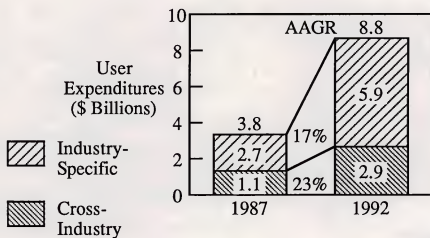
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On-line Data Base Market Size 1987-1992



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On-line Data Base Industry Summary Status-1987

- Two Million Customers
- 3,350 Data Bases
- Two Billion Records
- 1,500 Publishers
- 500 On-line Vendors

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Full Range of Services

Electronic Information Services

- On-line Data Bases
- Bulletin Boards
- Optical Media
- VANs
- Videotex

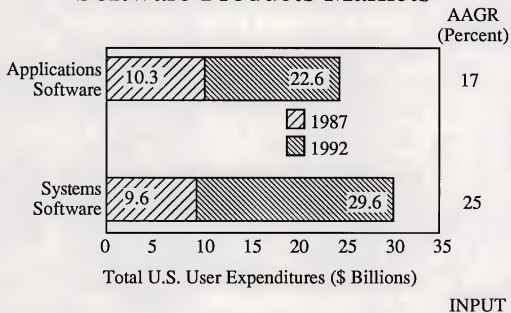
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Software Products Markets

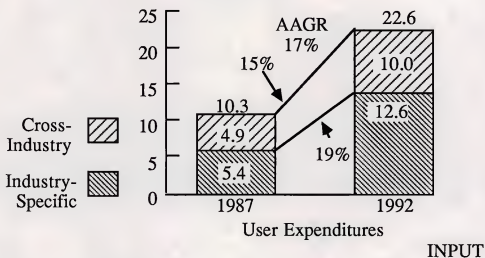


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Industry-Specific Applications Software to Increase Significantly (\$Billions)



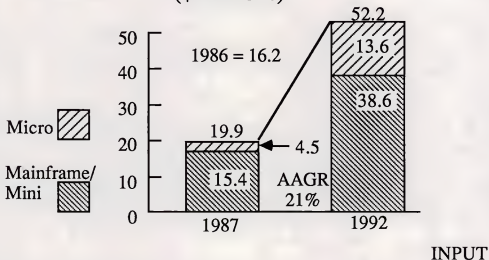
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Software Products Market Forecast, Mainframe/Mini and Micro: 1987-1992

(\$ Billions)



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Software Products Largest Vendors - 1986

	<u>(\$ Millions)</u>
IBM	2,900
DEC	618
HP	225

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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

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NOTES:

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Software Products

Hot Areas

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

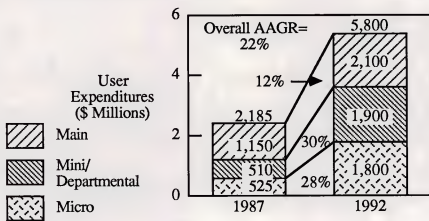
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Forecast for Data Base Management Systems: 1987-1992



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DBMS Futures

- Distributed/Networked/Interconnected
Dictionary Integrity, Data Integrity,
Performance, Reliability, Platforms
Supported (Transparency)
- Relational+ Functionality

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NOTES:

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DBMS Futures

- High Performance
- Standards Support
- Portability
- Open Architecture

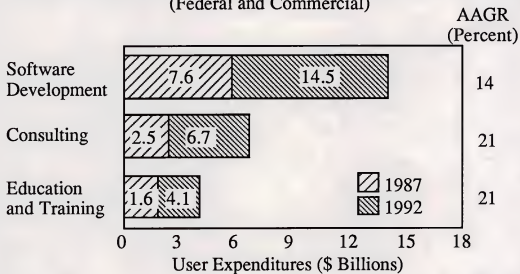
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Professional Services Market by Mode (Federal and Commercial)



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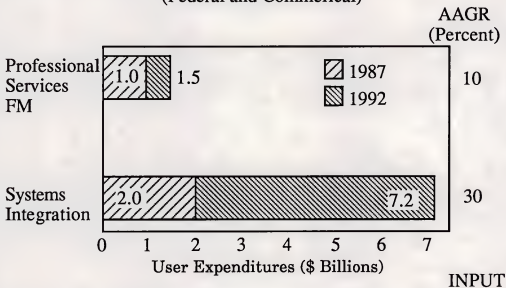
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Professional Services Market by Mode

(Federal and Commerical)



NOTES:

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Professional Services Largest Vendors - 1986

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

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NOTES:

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Systems Integration

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

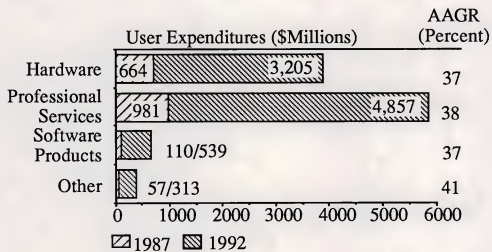
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Commercial Systems Integration Markets



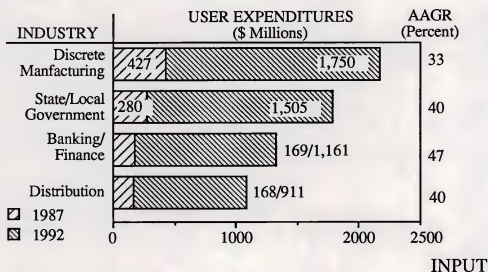
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NOTES:

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CSI Expenditures by Industry Sector 1987 - 1992

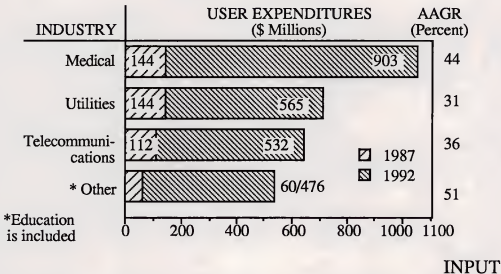


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CSI Expenditures by Industry Sector 1987 - 1992

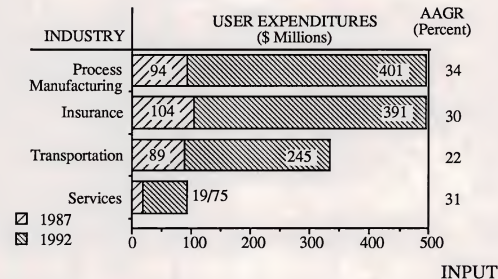


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CSI Expenditures by Industry Sector 1987 - 1992



NOTES:

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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

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NOTES:

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CSI Vendor Selection Criteria

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

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NOTES:

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CASE STUDY #2:

GPU
GENERAL PUBLIC
UTILITIES

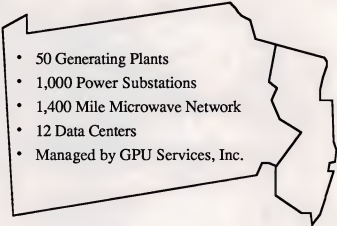
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Current Energy Management System

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

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NOTES:

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Problem

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

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Scope of Work

- Manage Entire Project
- Replace Current Hardware
- Consolidate to Four Sites
- Rewrite EMS

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NOTES:

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Scope of Work

- Develop Portable Applications Software
- Increase Inter-Processor Communications
- Five-Year Maintenance

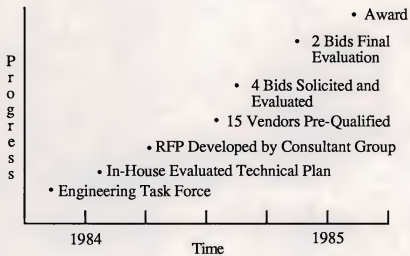
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Steps to Award



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Evaluation Criteria

- Expertise in EMS
- Revenue Size in Proportion to Project Size
- General Processor Capabilities

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Evaluation Criteria

- Ability to Develop Business Applications
- Size of Processor
- System Back-Up Plan

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NOTES:

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AWARD
CONTROL DATA
Energy Management Systems Division

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

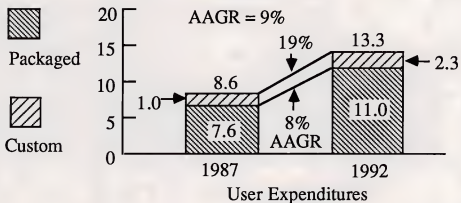
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Custom Vs. Packaged Turnkey Systems Market, 1987-1992 (\$ Billions)



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Turnkey Systems: Driving Forces

- Saturation Phase
 - Tough Market
 - Cost of Customization
 - Growth Slowing
- Hardware Vendors Providing Solutions

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Turnkey Systems: Driving Forces

- Customizing Potential
- Hardware Profit Contribution Decreasing
- Hardware Vendors Competing on Hardware Portion

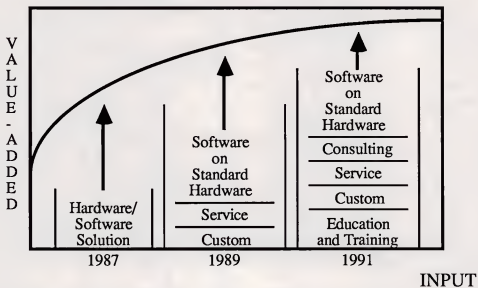
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Value-Added Services in the Future



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Special Turnkey Systems Vendors

Company	Characteristic	1986 Revenue (\$Millions)
IBM	Solution Pacs	NM
DEC	Systems Solutions	NM
Intergraph	Largest Turnkey Vendor Goes Proprietary	400

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SUMMARY COMMENTS AND CONCLUSIONS

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Key Questions

- Processing Services
 - IS Outside Sourcing Increasing?
- Software Products
 - How Much Do You Customize?

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Key Questions

- Professional Services
 - Are Core Products Necessary?
- Turnkey Systems
 - Continue to Sell Hardware?

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Macro Issues Information Services

- Focusing on End-User Needs (Vertical)
- Complexity Begets Customization
- Implementation Skill Mix Shortfall
Begets Professional Services Boom

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Macro Issues

Information Services

- Competitive Advantage Fuels Systems Integration
- Alliance Selection and Formation

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Information Services Appeal

- Leverages Core Businesses, Financial Assets
- Large, High-Growth Opportunities
- Potential for Significant Market Share
- Enhance Company Valuation
- Accelerate Technology Assimilation

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Impact on Company

- Potential Large Losses
- Organizational Upheavals
- Phases Honeymoon
 ↓
 Disappointment
 ↓
 Resurgence
- Can Evolve to Major Business Segment

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Conclusions

- Information Services Outlook Bullish
- Technology Provides New Opportunities

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Information Systems Recommended Changes of Emphasis

1987 - 1992

Data Processing	—————▶	Information Flow
Information Quantity	—————▶	Information Quality
Automation of Process	—————▶	Improvement of Process

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