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Overview

The U.S. Information Processing Market

Presented by:

intex

International Technology Exchange Group (Intex-USA)

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Topics of our discussion

This project was completed for Jampro to mainly achieve the following:

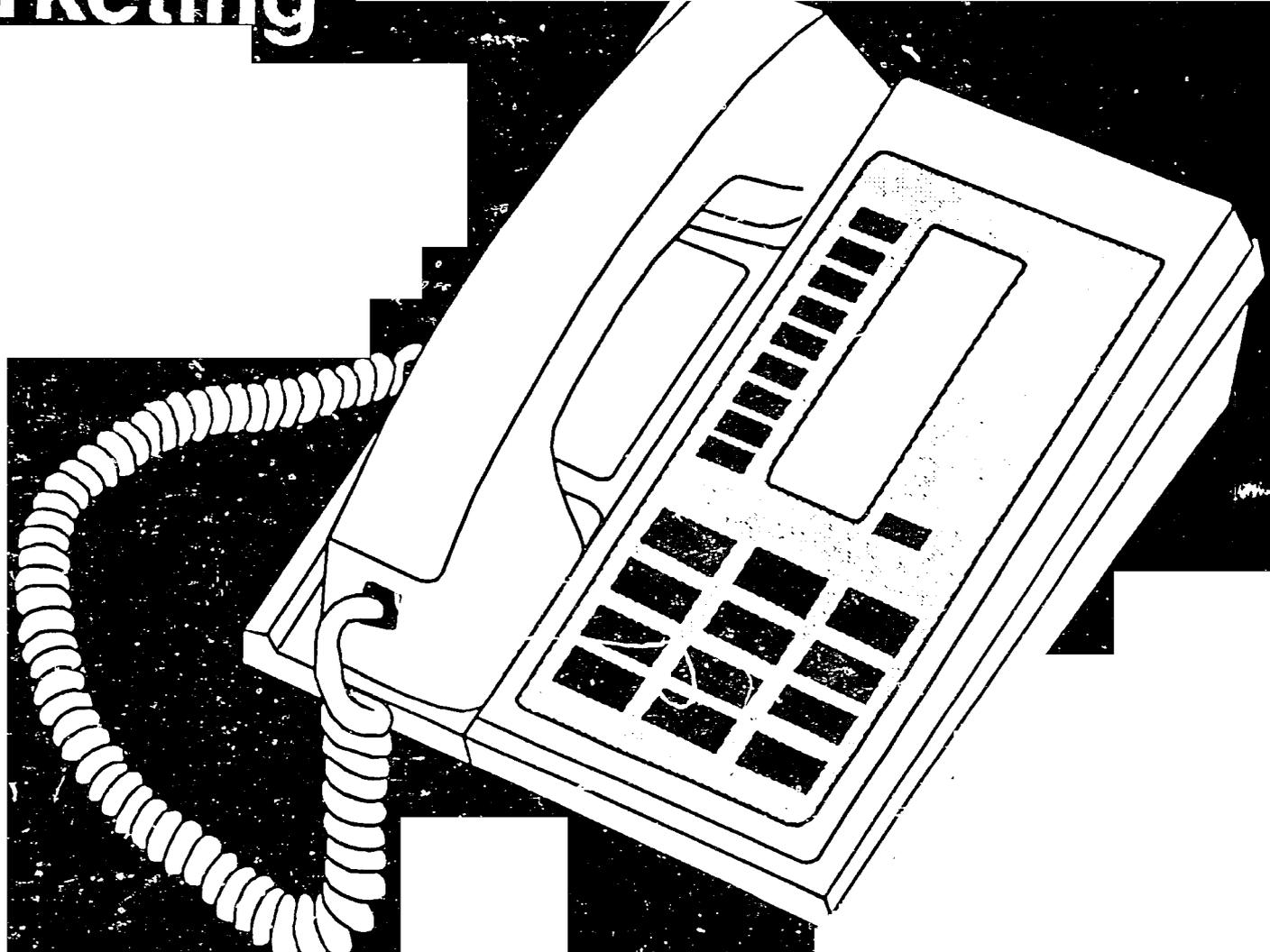
- **Identify and describe major sectors in the U.S.**
- **Verify the potential opportunity for Jamaica**
- **Evaluate local Jamaican capabilities**
- **Compare the unique characteristics**
- **Develop strategies and recommend policies**
- **Recommend strategies to ensure near future and long-term viability**

North American Information Processing Market

Principal technologies / services:

- **Data Entry**
- **Document Imaging**
- **Computer Aided Design/Computer Aided Manufacturing (CAD/CAM)**
- **Geographic Information Systems (GIS)**
- **Telemarketing**
- **Programming**

Telemarketing



Telemarketing...Overview

- **First used in the 1960s as a method of contacting existing clients**
- **Primary usage was for direct sales**
- **Enables a large number of sales, in a short period of time, with minimal capital investments**
- **By 1996, approximately \$700 billion of sales will result from telemarketing operations**

Telemarketing...Growth Drivers

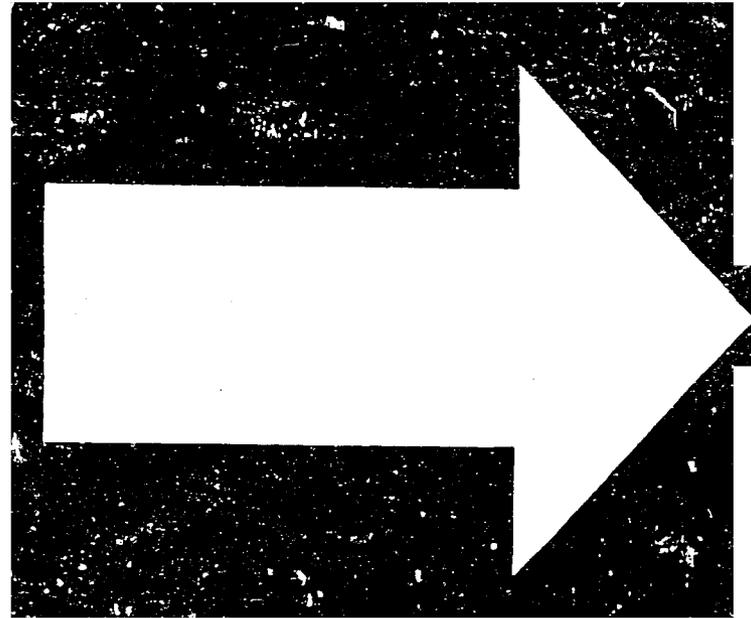
Drivers

GREATER TIME CONSTRAINTS
ON THE BUYING PROCESS

GROWING FOCUS
ON CUSTOMER RELATIONS

IMPROVED TELEMARKETING
TECHNOLOGY

INCREASING COSTS OF
TRADITIONAL SALES TECHNIQUES

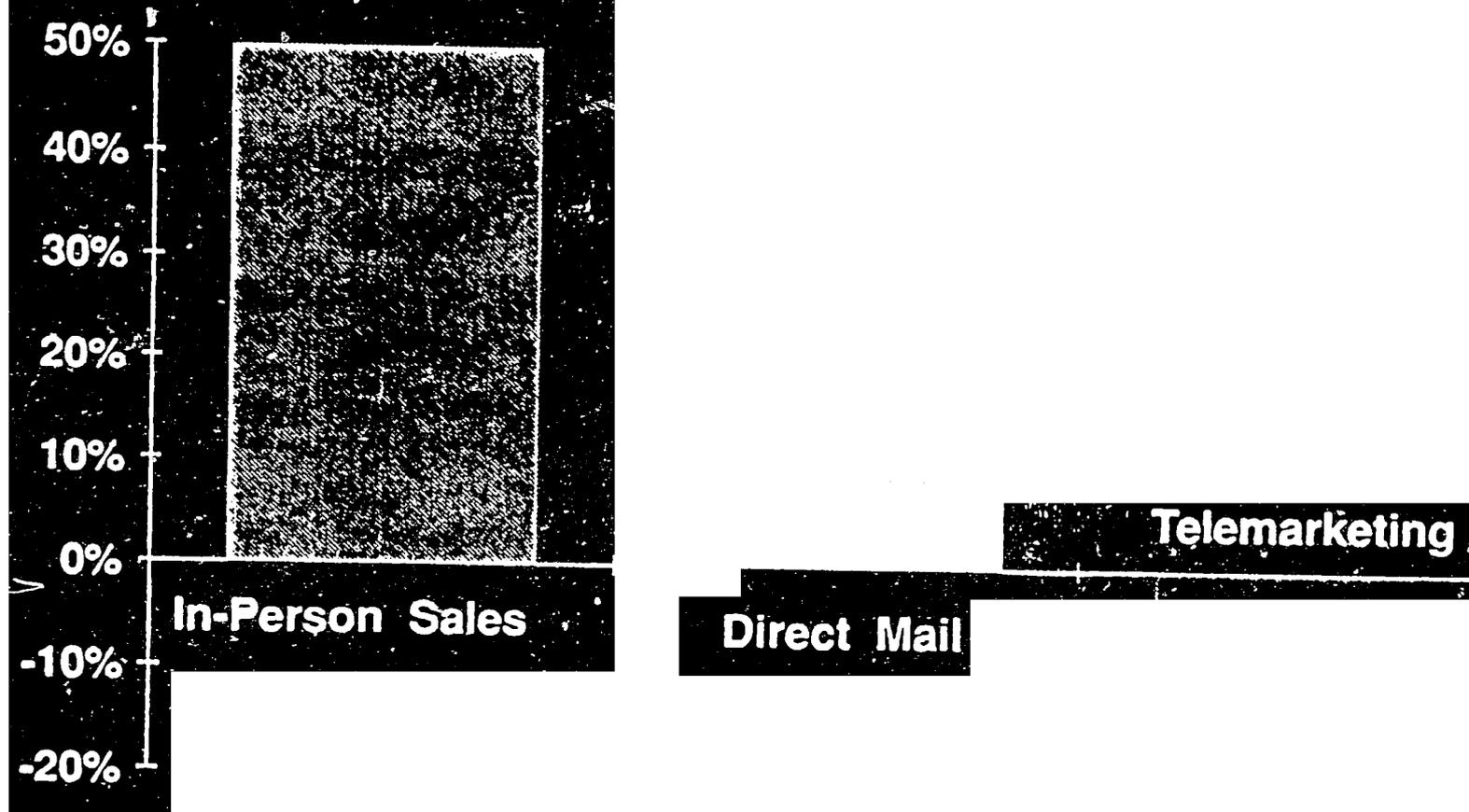


Result

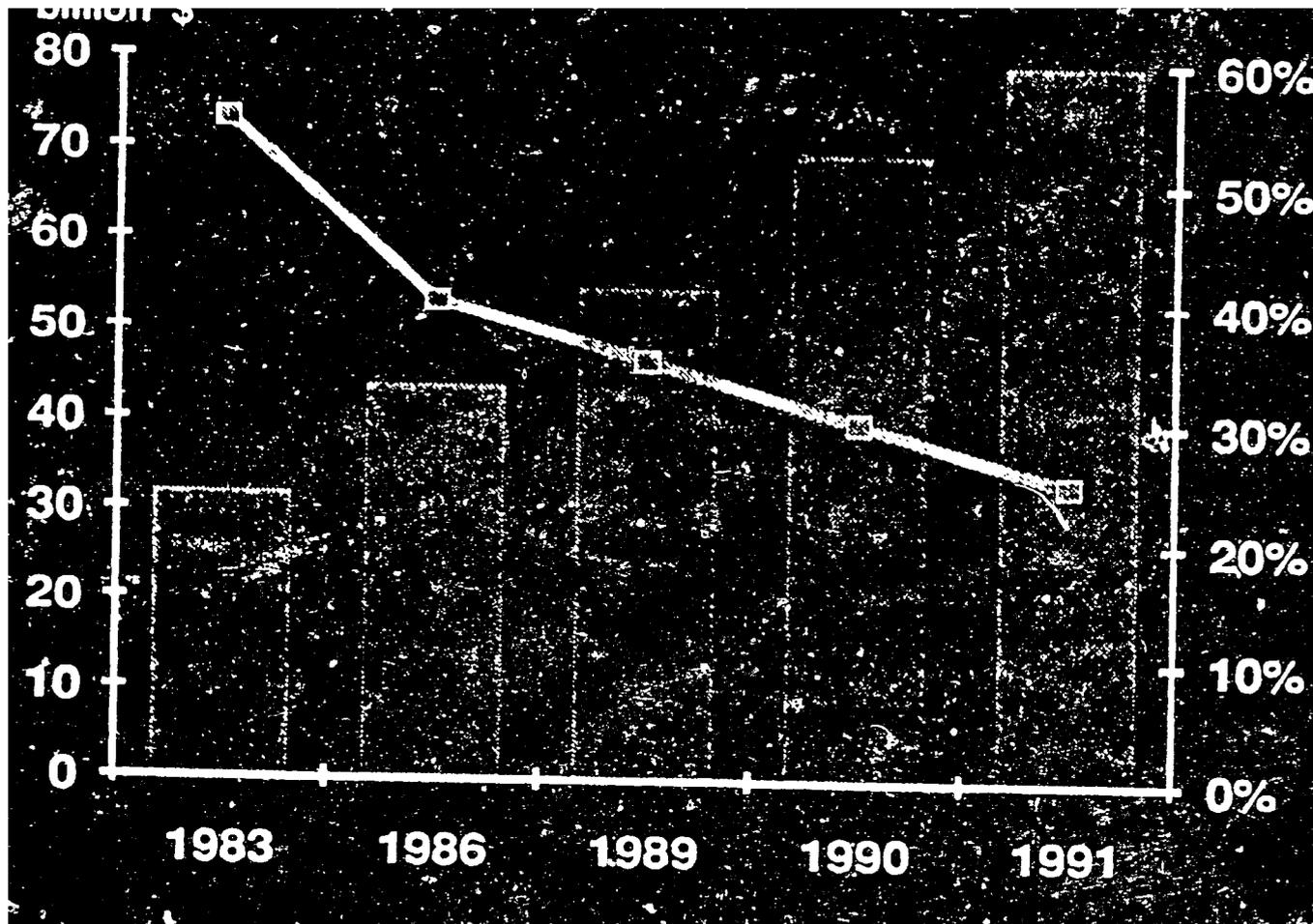
GROWTH
OF THE
TELEMARKETING
INDUSTRY

Telemarketing...Improved Cost/Effectiveness

Average Change in Cost for Types of Sales
Sales Methods, 1989-90



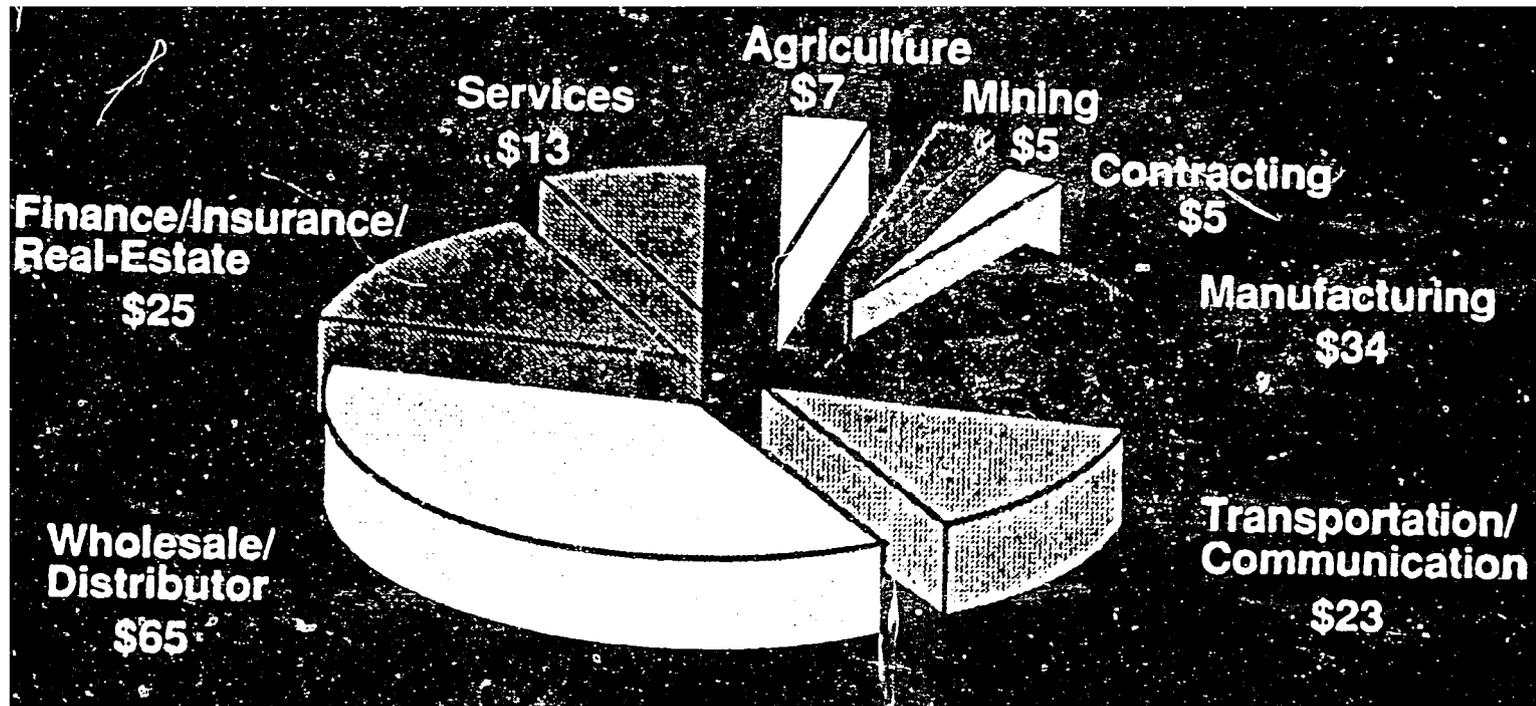
Telemarketing..Improved Cost/Effectiveness



The cost /revenue ratio has decreased from 55% to 25%

Telemarketing...Customer Profile

**Total Sales Per Sector Through Telemarketing Operations
(in billions of dollars)**



Telemarketing...Operations

The industry can be segmented into two segments:

■ **INBOUND – Receives phone calls**

- Less complex, prospect already interested
- Dealer locators
- Warranty service/customer support
- Catalog orders
- Banking/brokerage services

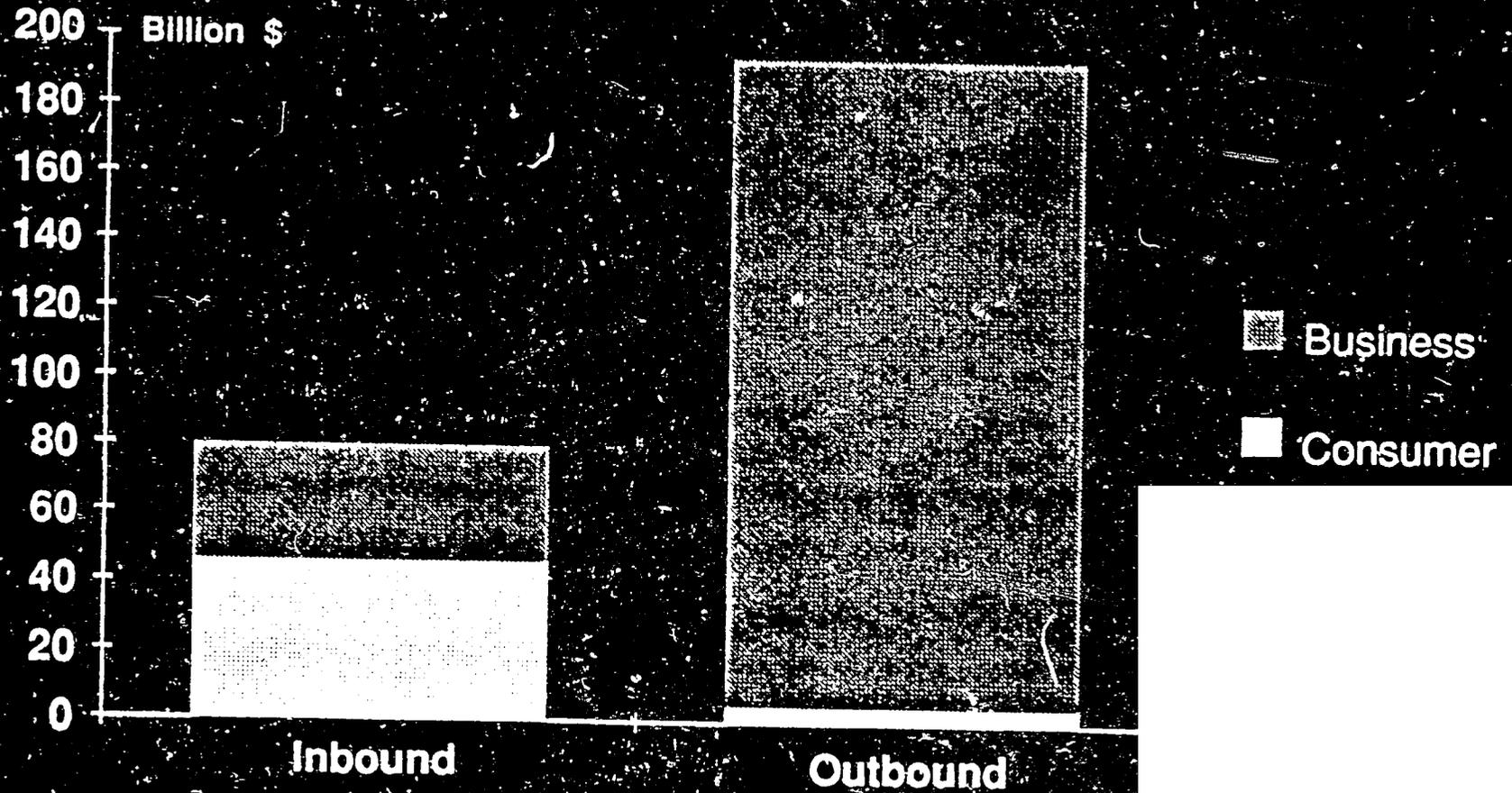
■ **OUTBOUND – Make phone calls**

- Require higher skill, prospect's interest in product unknown
- Product surveys
- Direct marketing
- Credit card services
- Travel services
- Product recalls

■ **Operations include business to business, and consumer to business**

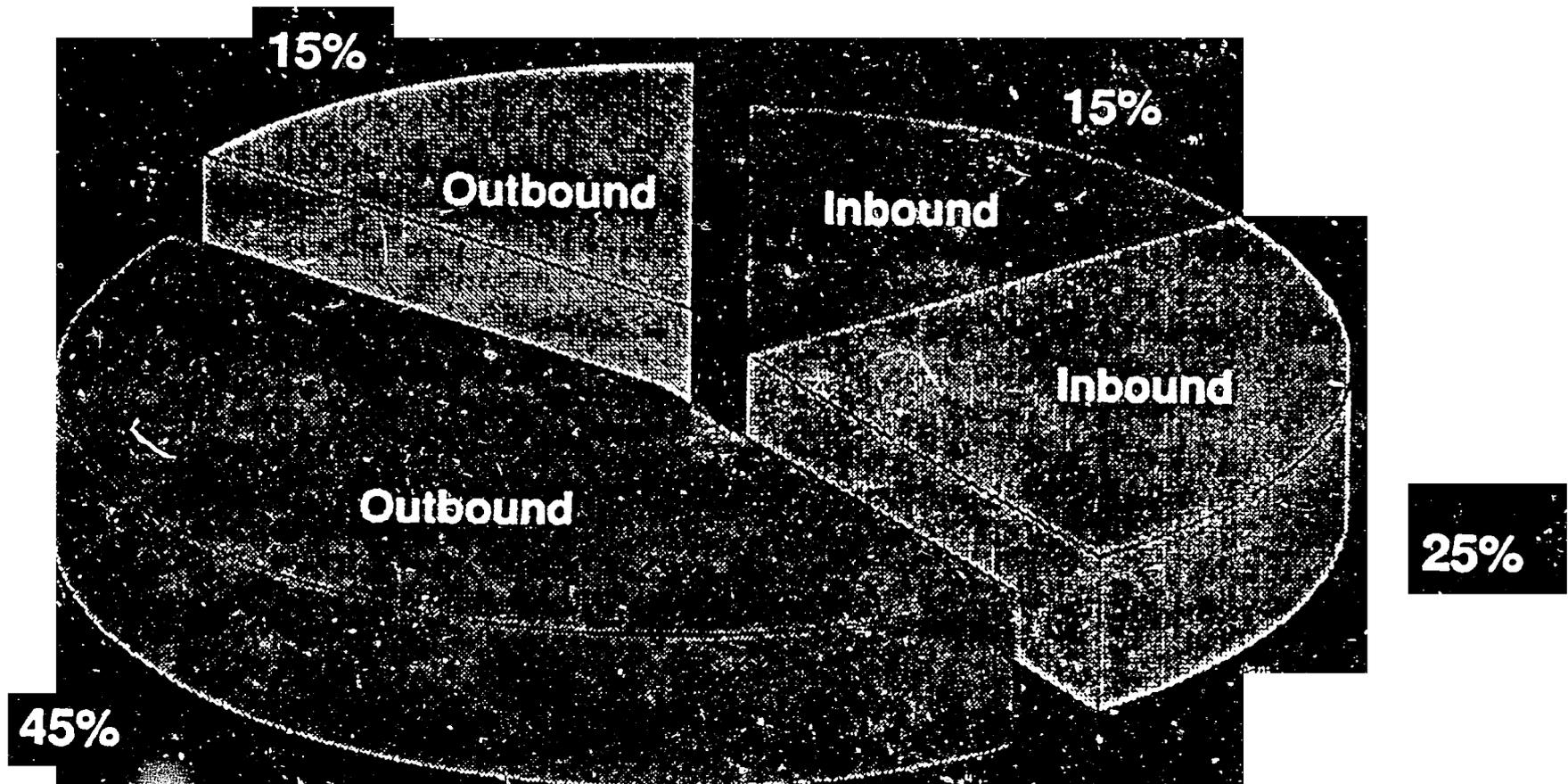
Telemarketing... Market Profile

Total 1991 Sales Revenue for the Telemarketing Industry



Outbound operations yield higher revenues

Telemarketing... Market Profile



Expenditures are heavily weighted towards outbound operations

Telemarketing... Sample of Users

Business-to-business

American Express

3M

IBM

Digital Computer

DuPont

Federal Express

U.S. Government

Wharton Econometrics

Valvoline - 90% of orders by phone

Digital - order processing

Business-to-consumer

Sears, Roebuck

Spiegel

J.C. Penney

L.L. Bean

Sharper Image

Garden Way

Harvard University

Republican National Committee

Clairol - Product Use

B.F. Goodrich - Marketing

Quaker Oats - Sweepstakes promotions

Whirlpool - Support, warranty

GE - premier inbound service

Telemarketing...Outsourcing Opportunities

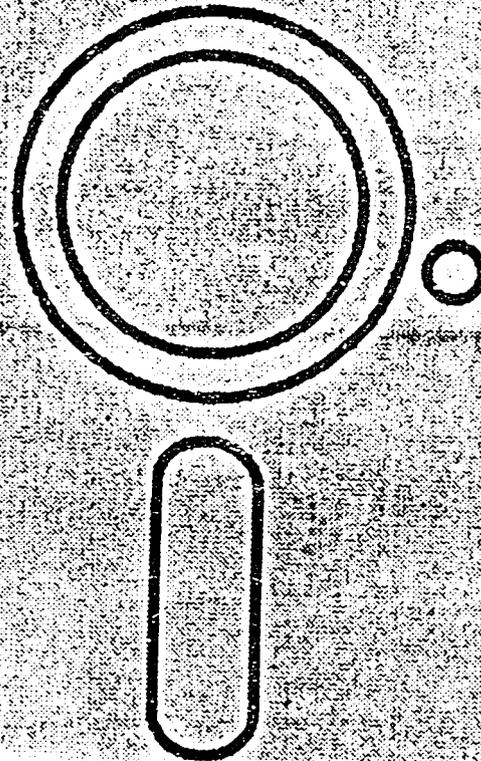
Despite the large amount of expenditure on telemarketing operations, a small percentage is outsourced to "Service Bureaus."

- **Approximately \$500 million per year is outsourced to inbound and outbound telemarketing**
- **The market potential for off-shore operations is significant**
- **Inbound operations seem most suitable for Jamaica**

Telemarketing...Trends

- **Customer base not likely to shift dramatically.**
- **Technology is becoming more advanced, requiring a higher level of training and investment.**
- **Competition will be from other Caribbean English speaking countries; time zone differences make it difficult for others to compete**
- **Cultural affinity, accent, and training levels are major determining factors for U.S. firms**
- **In niche product markets, operations will be kept in house**
- **Legitimate telemarketing operations are often marred by disreputable activities**

Programming



Programming...Overview

■ Prepackaged Software

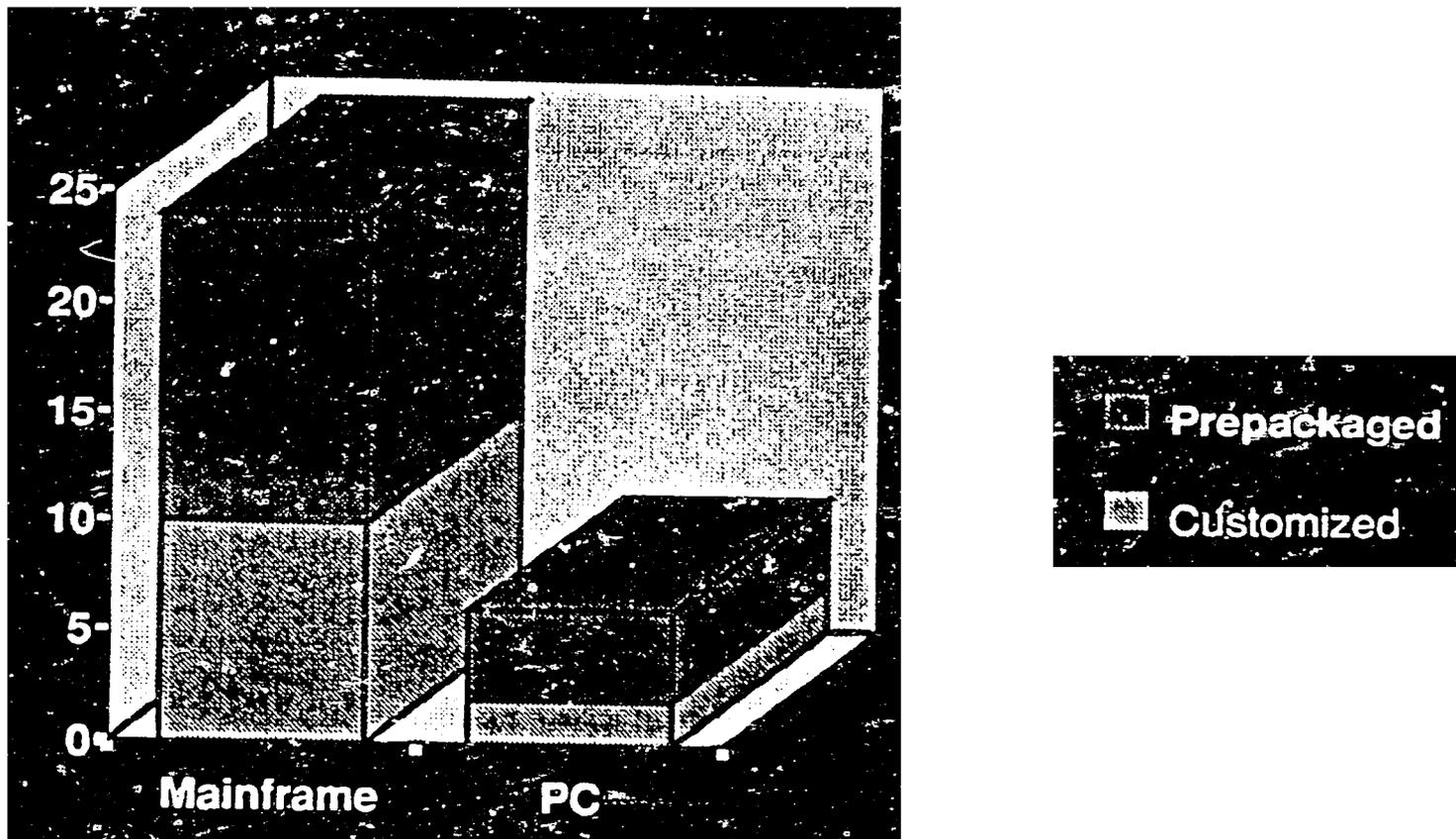
- System software
- Off-the-shelf application software
- Tends to be more "well-specified."
- Market size is estimated to be nearly \$18 billion.

■ Customized programming

- Tailor-made, prepackaged software
- Creation of totally new application software for a specific usage
- Tends to be more "Ad-hoc."
- Market size is estimated to be \$12 billion

■ Estimated off-shore market is 10% of the total market

Programming Market

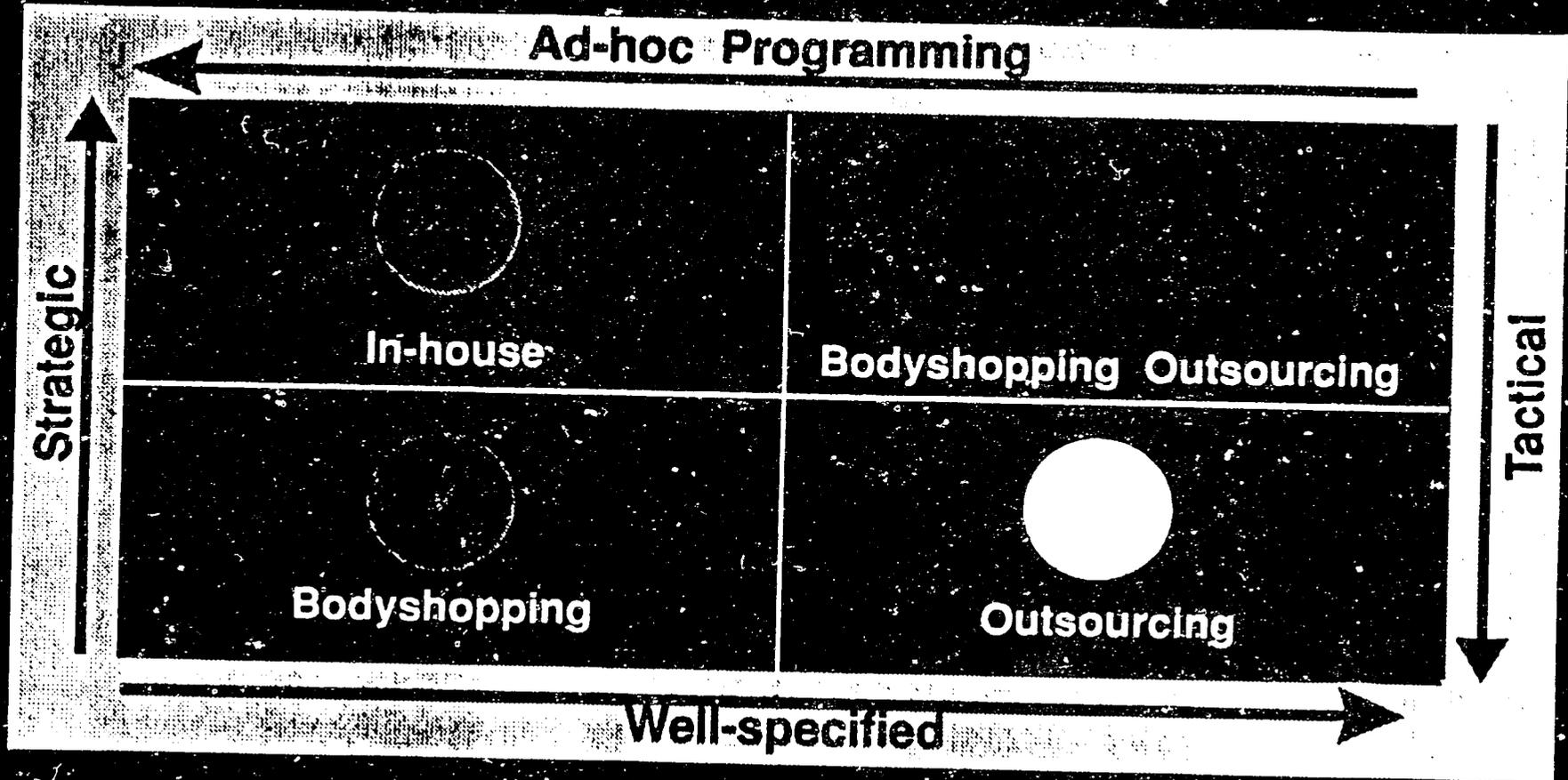


Mainframe programming constitutes the majority of the market, Minicomputers/Microcomputers programming is increasing rapidly.

Programming...Issues in Outsourcing

- **Companies more likely to outsource those functions with a "tactical" or maintenance impact**
- **Strategic business functions are sensitive and are handled "in-house."**
- **Companies realize a higher value per worker by retaining the knowledge of strategic systems in-house.**
- **Project management and experience is key for selecting programmers**

Programming... Strategic Implications for Businesses



Programming...Critical Success Factors

- **Labor cost**
- **Nature of work**
- **Shortage of in-house skills**
- **Reputation and perception of quality**
- **Training**
- **Technology obsolescence**
- **English language**

Programming... Competitor Profile

■ India

- **Active in the U.S. market since the 1970's**
- **U.S. market share almost \$230 million, with 30% growth/year**
- **Use "bodyshopping" and local teleports**
- **Average programmer is 30 years old with a masters and 4 years of experience**
- **Workforce used by all major computer firms, i.e., IBM, DEC, etc.**

■ Brazil, China, Ireland, Singapore, etc.

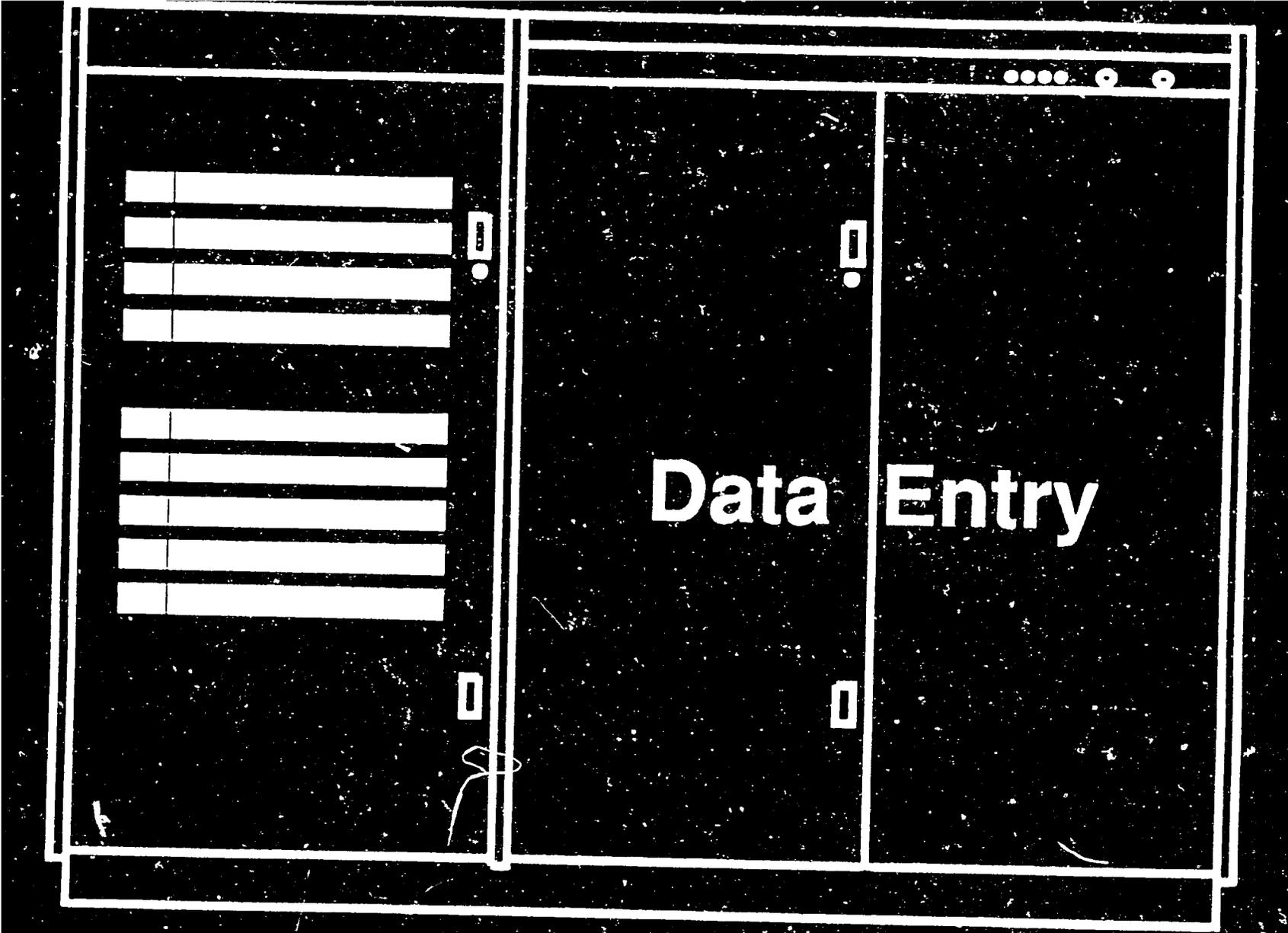
- **Are or will be potential players in this market**
- **Language is a major problem**
- **Telecommunications and distance are also problems**
- **Ireland has higher wages**

Programming...Bodyshopping

- **Bringing foreign programmers to the U.S. may become more difficult**
- **There are currently 20-50,000 Indian programmers in the U.S.**
- **Typical bodyshopping contract offers a 30-day guarantee -- no satisfaction, no payment**
- **Contracts are usually on fixed-cost basis**
- **U.S. firms usually look to save 30-40% off a regular rate**

Programming...Off-shore Opportunities

- **English is a major advantage**
- **More suitable for well-defined, pre-packaged programming**
- **Software standardization will increase off-shore programming**
- **Improved system cost/performance enables purchase of advanced systems for training and development**
- **Competition likely to increase from Mexico**



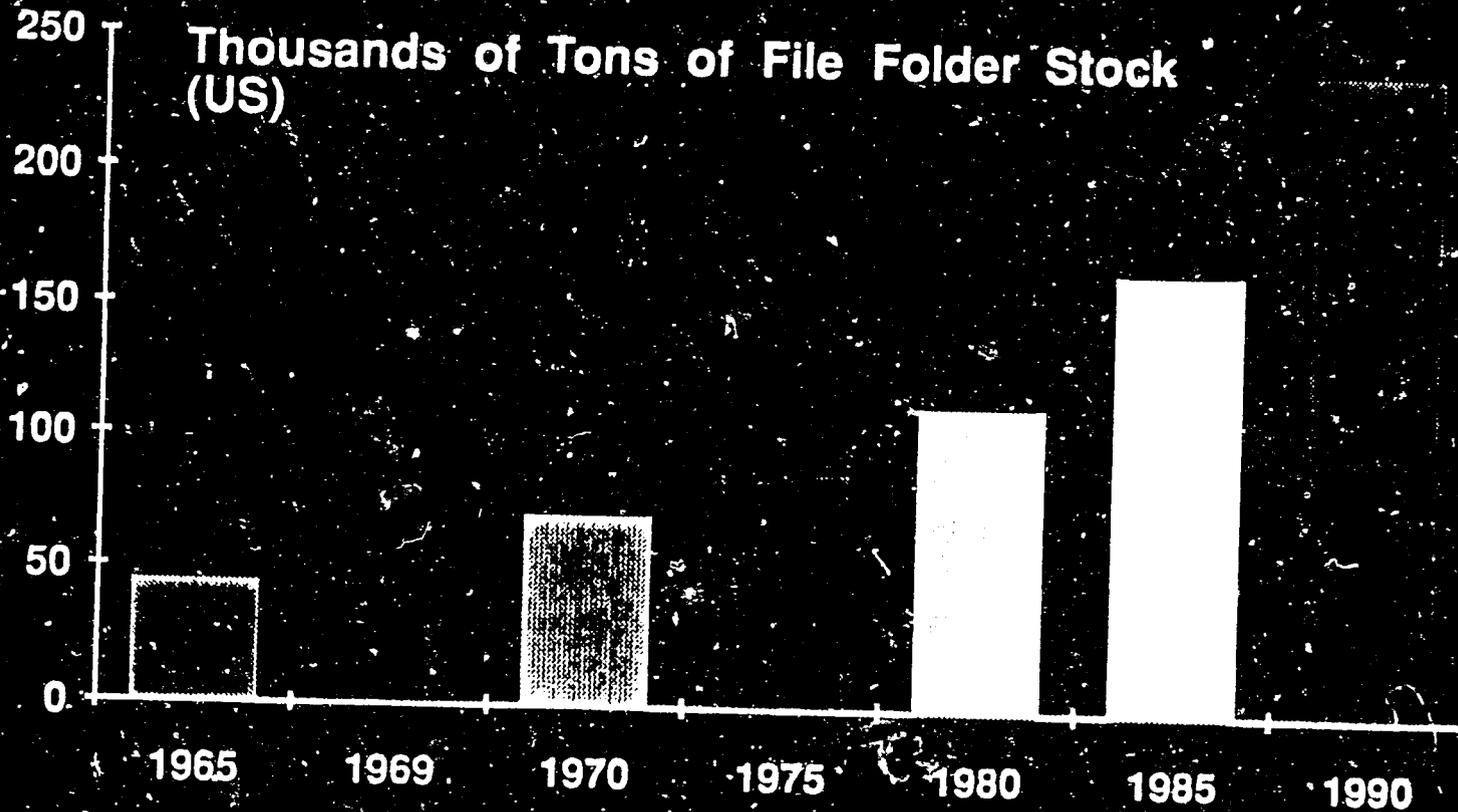
Data Entry

Data Entry...Overview

- **Captures data by keying in, scanning, or digitizing information into computer readable files**
- **Involves manual and automated processing, i.e., OCR, Bar code readers**
- **Used by all sectors of the industry to process and manage information**

Data Entry...Growth of Paper

The Accelerating Growth of Paper-Based Filing



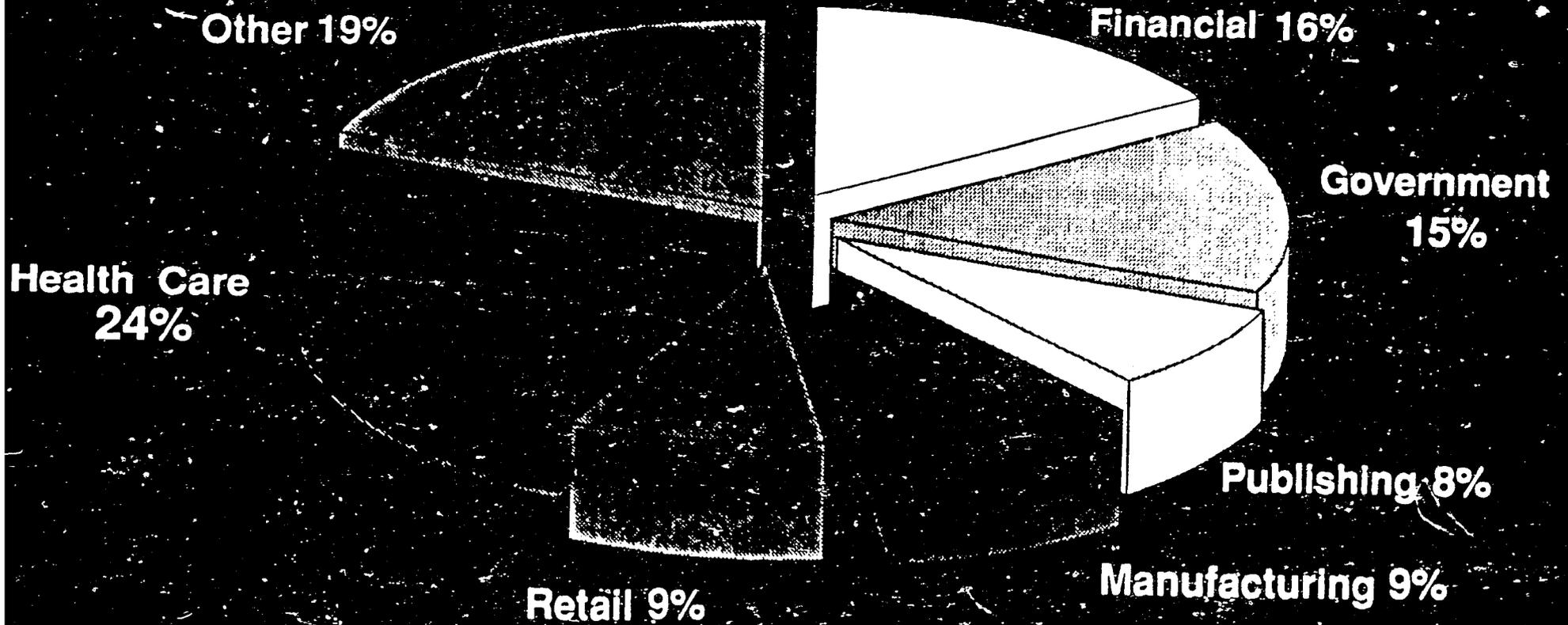
An estimated 324 billion pages of paper currently exist in US offices-growing at a rate of 22% annually

Data Entry...Information Processing

- **The total revenues of the information processing/data processing market is estimated to be about \$31 billion.**
- **Data entry is estimated to constitute about 20% of this market, or \$6.4 billion.**
- **The data processing market is growing at an approximate rate of 16% per year**

Data Entry... Users of Data Processing

Data Processing Expenditures by Sector



Data Entry...Factors Considered for Outsourcing

- **Investment in computer systems**
- **Data sensitivity**
- **Quality control**
- **Cost**
- **Turn-around time**
- **Volume of Information**

Data Entry.. Users of In-House and Outsourcing Services

In-house

New York Life Insurance Company

The Chase Manhattan Corporation

McGraw Hill Information Services

Bureau of the Census

Cigna Corporation (financial Services)

Mead Data Central (publishing)

Information Access Corporation (publishing)

WESTLAW Incorporated (publishing)

Massachusetts Mutual Life Insurance Co.

Kennedy Space Center

IBM

Off-site

Sears, Roebuck

DIALOG (financial services)

BRS (financial services)

Mead Data Central (publishing)

Knight-Ridder (publishing)

McGraw Hill Publishing Company

American Airlines

NPD/Nielson Inc. (research/publishing)

Texas Instruments Inc.

Digital Inc. (computer software company)

BDP Business Data Services LTD.

Data Entry... Number of Firms in US Regions



Data Entry...Market Trends

- **Number players in key-entry will increase -- China, Philippines, India, Eastern Europe, Latin America, Zimbabwe**
- **Telecommunications will reduce the importance of geographical proximity**
- **Low-end, highly manual functions will become more automated, i.e., EDI, OCR, Voice Data Entry, Bar Code Systems, Intelligent Forms processing**
- **Cost alone will not guarantee contracts, quality is essential**

Data Entry...Critical Success Factors

Changes that will strengthen the data entry industry in Jamaica

Reliance on labor
cost alone

Migrate to niche, high-end
services

Traditional small
scale marketing for
key-entry services

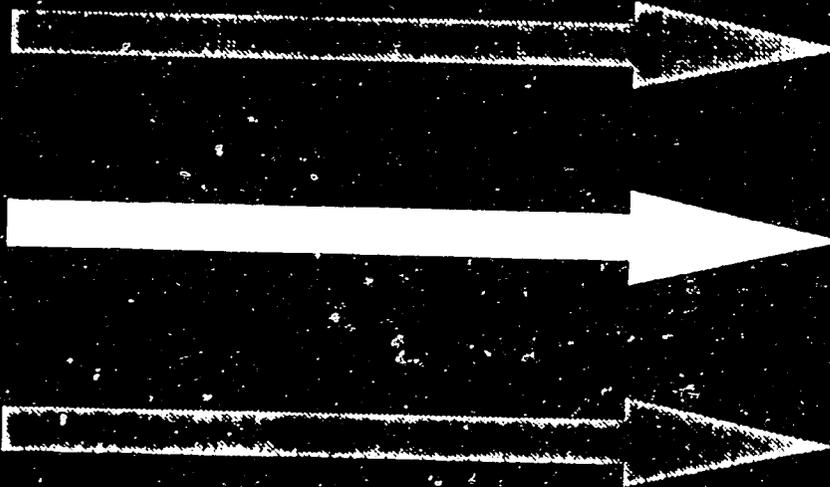
Strategic marketing for
high-end services

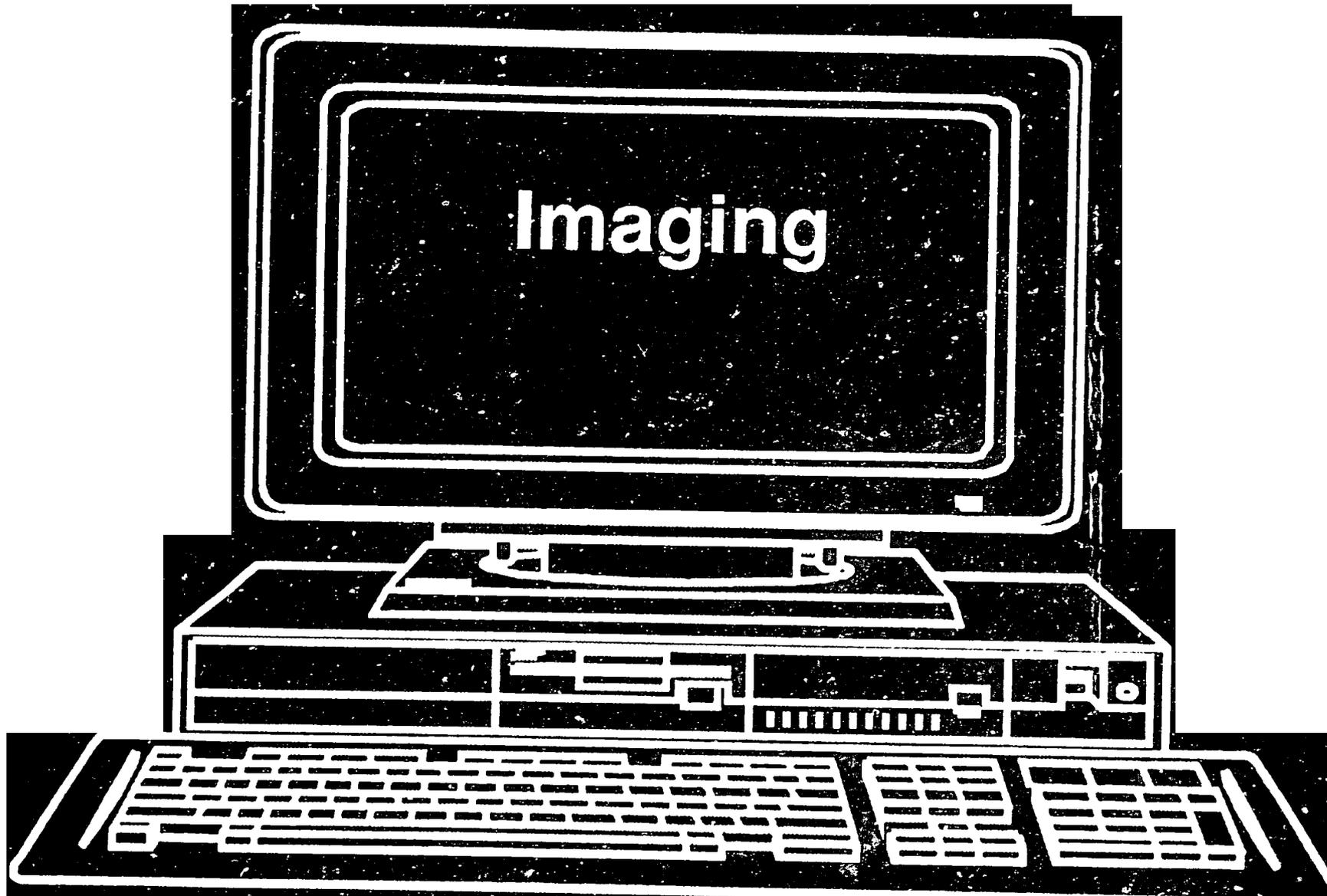
Marketing to
end-users only

Vendors and system
integrators alliances

Small scale operations

Efficient production-type
operations





Imaging

Document Imaging...Overview

- **Uses a technology similar to fax machines, digitizes paper-based information to computer information**
- **Stores very large amounts of data on optical disks, 200,000 pages on a disk**
- **Enables retrieval, routing, and processing of vital information in minutes instead of hours or days**
- **Maintains records safely for a long period of time**
- **Indexes information for easy access to strategic information**
- **Increases productivity in workplace**
- **Reduces paper handling and storage costs**
- **Improve security and control of information**

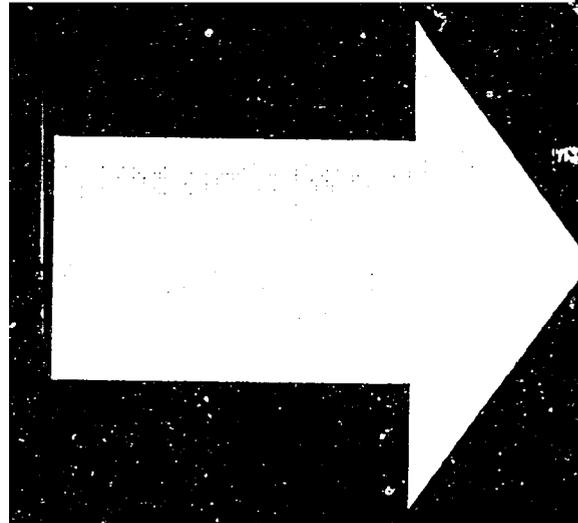
Document Imaging...Growth Drivers

Drivers

Improved technology
cost/performance

Office Automation/Need
to Make Workplace
More Efficient

Use of
Information as a
Strategic Asset

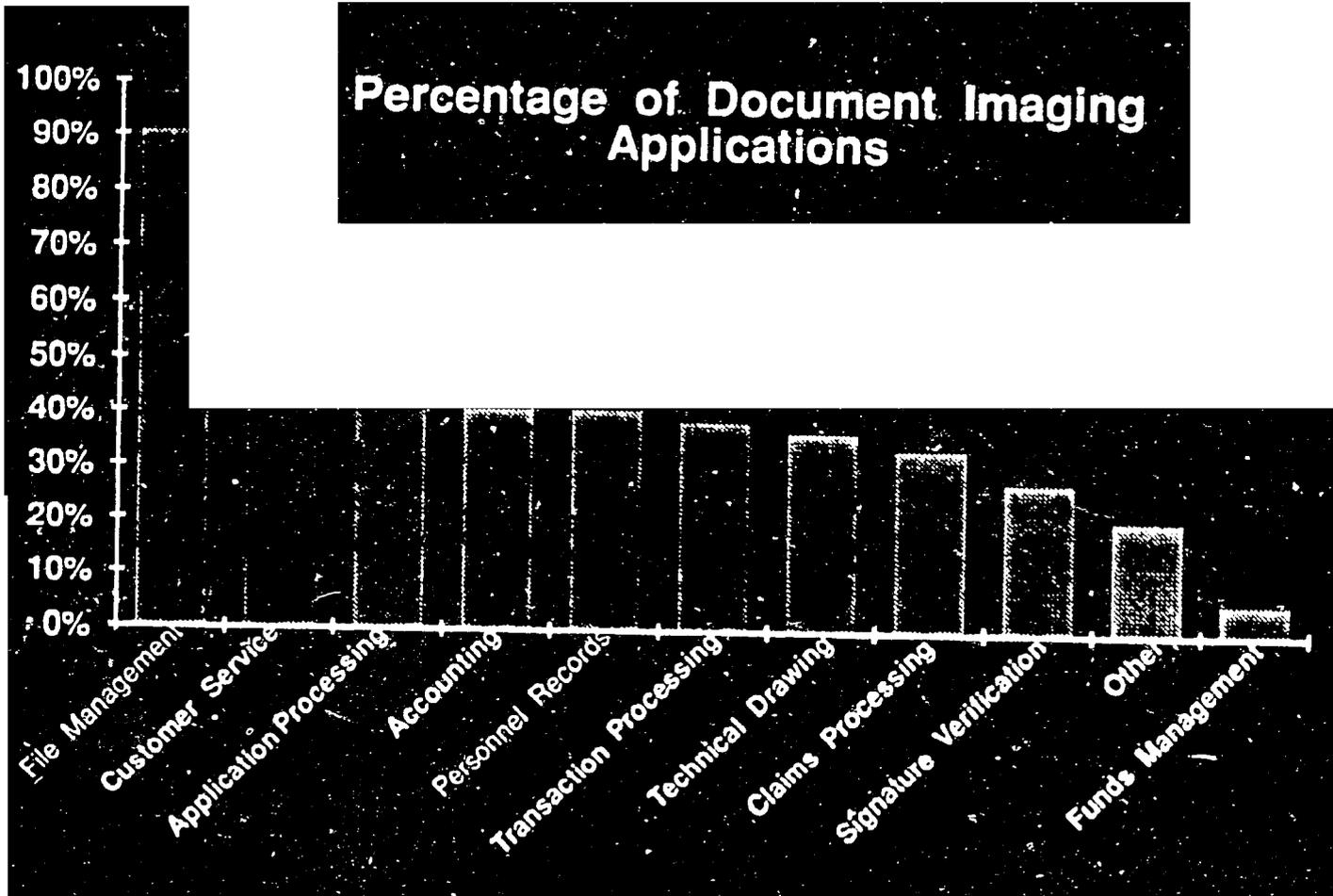


Result

Growth In PC,
Mini and Mainframe
Based Document
Imaging Systems

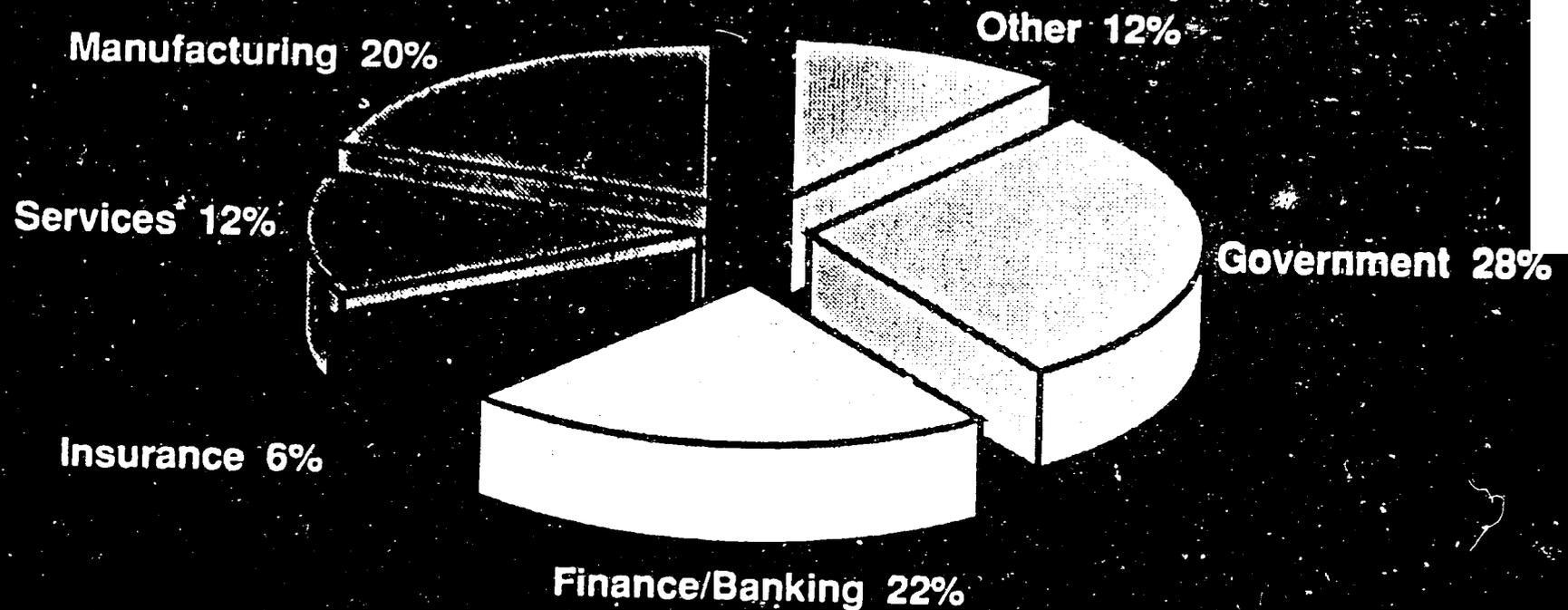
Document Imaging... How are Systems Used

Percentage of Document Imaging Applications



Document Imaging... User Profile

Annual Expenditure on Document Imaging by Sector



Nearly 60-70% of all organizations with paper intensive operation already have or will implement a Document Imaging System

Document Imaging... Sample of User Profile

Federal Government

Veterans Administration
Environmental Protection Agency
Department of the Navy
Department of the Army
Federal Reserve Bank
Federal Bureau of Investigation

Local Government

Penn. Liquor License Board
Illinois State of Employment Agency
California Motor Vehicle Dept.
State of Virginia
Wisconsin Motor Vehicle Dept.
State of Minn. Dept. of Motor Vehicles

Manufacturing

3M Company
Ralston Manufacturing
Westinghouse
GTE
GE
Boeing Aerospace

Document Imaging... Sample of User Profile

Insurance Firms

USAA

The Hartford Insurance
Group

Workers Compensation
Board of Ontario

Paul Revere Life Insurance
Company

General American Life
Insurance Company

Pacific Life Insurance
Company

Banking/Financial

Texas Commerce Bank

Merrill Lynch

First National Bank of
Maryland

Goldman Sachs

Kligger Peabody

American Express

GTE Financial

Bank One of Columbus

Services

MCI Corporation

Arco Gas

Baltimore Gas and Electric
Nuclear Facility

Pennsylvania Power and
Light Company

Nebraska Power

PSE&G Nuclear Power Plant

AVIS

HERTZ

Fleet America Trucking
Company

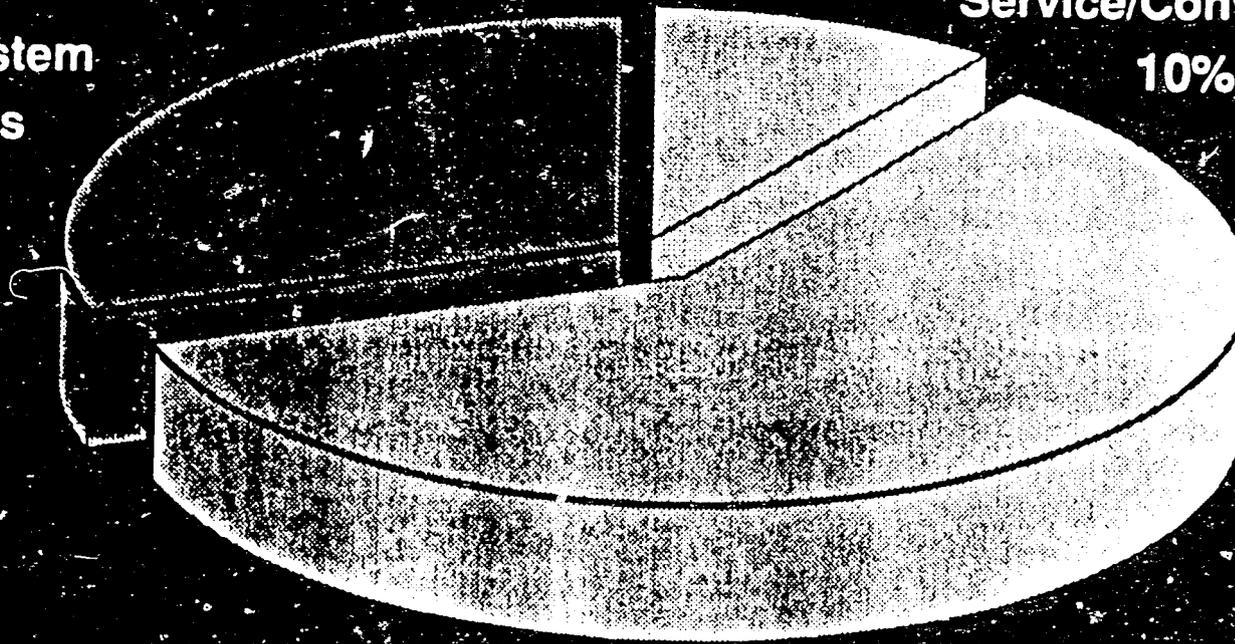
Document Imaging.. Market Segments

The Current Estimated Document Imaging Market

**Software/System
Integrators
30%**

**Service/Conversion
10%**

**Hardware/Peripherals
60%**



Document Imaging...The Conversion Process

- **Conversion is labor intensive**
- **Conversion is critical for storing vital information**
- **Conversion is quality dependent, finding a mis-indexed document is like finding a needle in a haystack**
- **The higher the cost of an error, the more important is the QC process**

Document Imaging... Conversion Techniques

■ **Backfile Conversion: Digitizing all existing information**

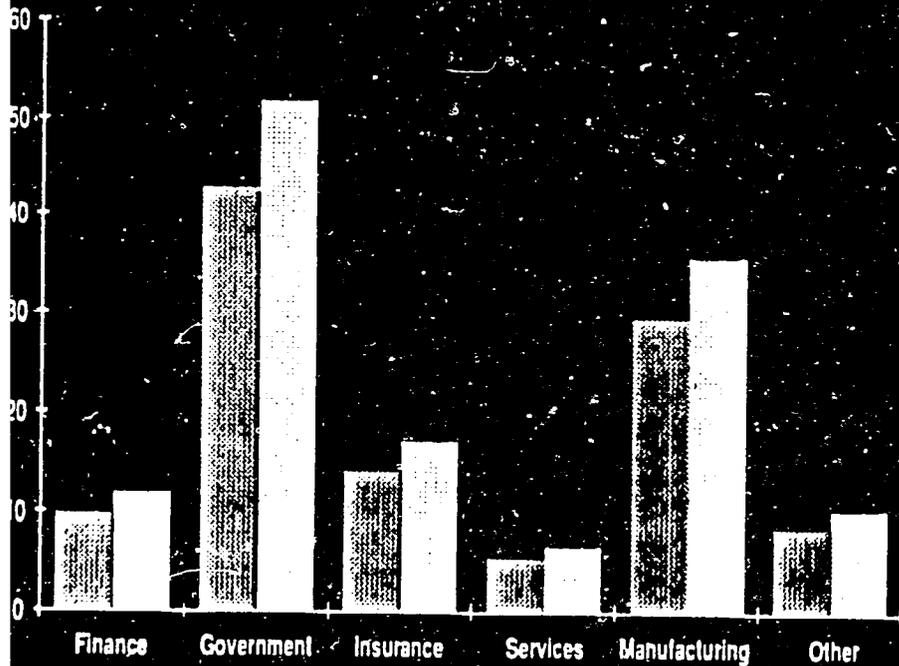
- **Archival files**
- **Historical data**
- **Personnel files of employees**

■ **Recurring Conversion: Digitizing the information that is commonly used or generated on a daily basis**

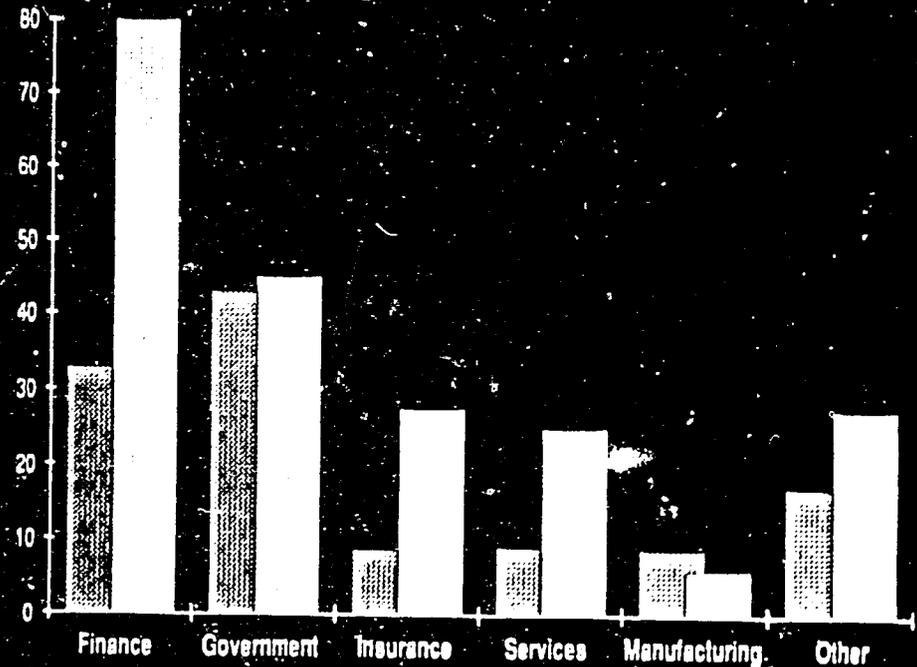
- **Active files**
- **Credit card applications**
- **Airline tickets**
- **Car insurance forms**
- **Accounting receipts**

Document Imaging... The Conversion Market

Backfile Conversion



Recurring Conversion



■ 1992 estimated ■ 1994 estimated growth
(millions of US\$)

Document Imaging...Critical Issues

- **Where the cost of error is high, conversion is completed in-house**
- **Proprietary information and legal documents not permitted to leave premise**
- **Vendors want to sell more equipment to users and discourage outsourcing**
- **Outsourcing imaging activities still new, managers are risk averse**
- **Imaging users demand quick turn-around times, telecommunication is key for data transfer**
- **Standardization still a problem in imaging, conversion from one system to another often problematic**

CAD/CAM

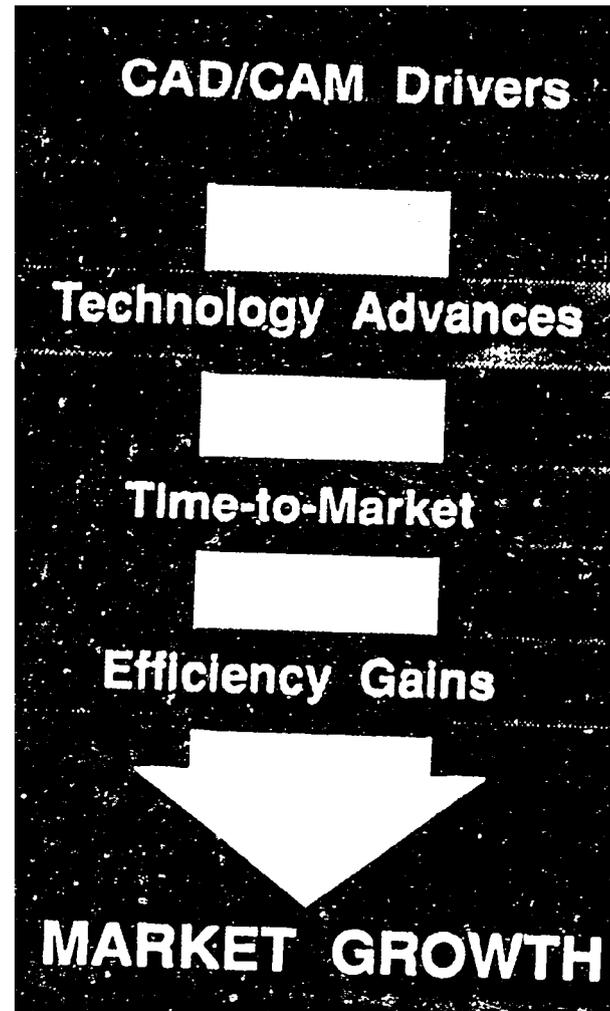


CAD/CAM...Overview

- **Computer Aided Design (CAD): Computer-based tool to facilitate the construction of highly detailed drawings**
 - CAD systems have a library of stored shapes
 - Complexity ranges from two to three dimensional (2-D) and (3-D)
 - 3-D tools enable "as-is" modeling to simulate product performance

- **Computer Aided Manufacturing (CAM): Computer-based tool to control the entire production process**
 - CAM provides quality control and inventory management tools
 - Enables the communication of errors/shortages on the manufacturing line

CAD/CAM... Major Growth Drivers



CAD/CAM...Benefits to Users

- **Improved Efficiency**
- **Reduced Cost**
- **Management of Information**
- **Process Control**
- **Manufacturing Flexibility**

CAD/CAM... Profile of Users

Government

- **NASA**

- **Department of Defense**

Non-Profit Organizations

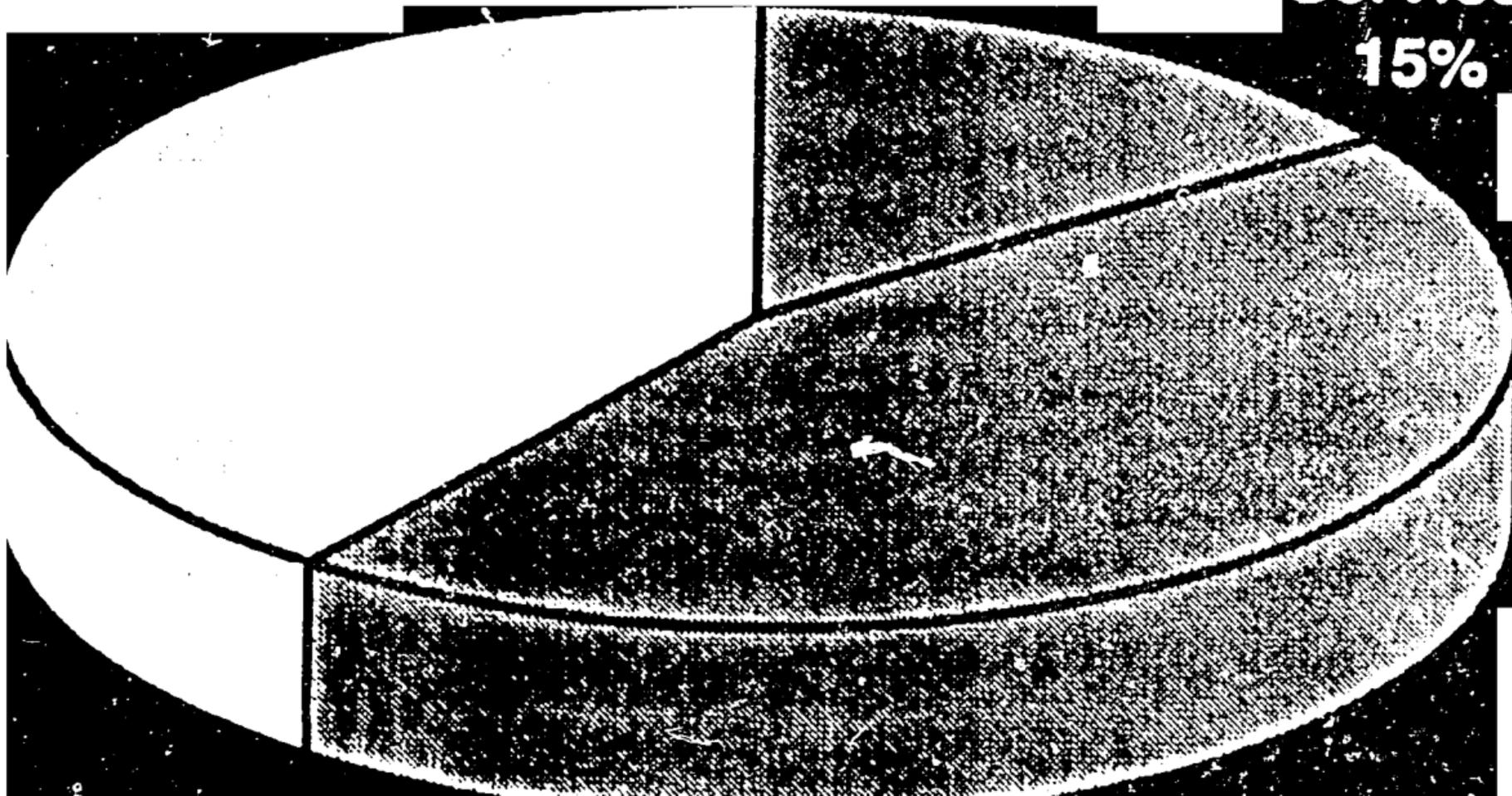
- **Universities**

- **Research Institutes**

Commercial Organizations

- **Architectural Firms**
- **Construction Firms**
- **Industrial Companies**
- **Electronic Firms**
- **Manufacturing Firms**

Service
15%



CAD/CAM...The Overall Conversion Market

■ **Conversion/Translation - 20% of services**

- **Translating from one graphic system to another**
- **New to new system**
- **Old to new system**
- **Conversion of hand drawing to computer format**

■ **Drafting/Layout - 35% of total services**

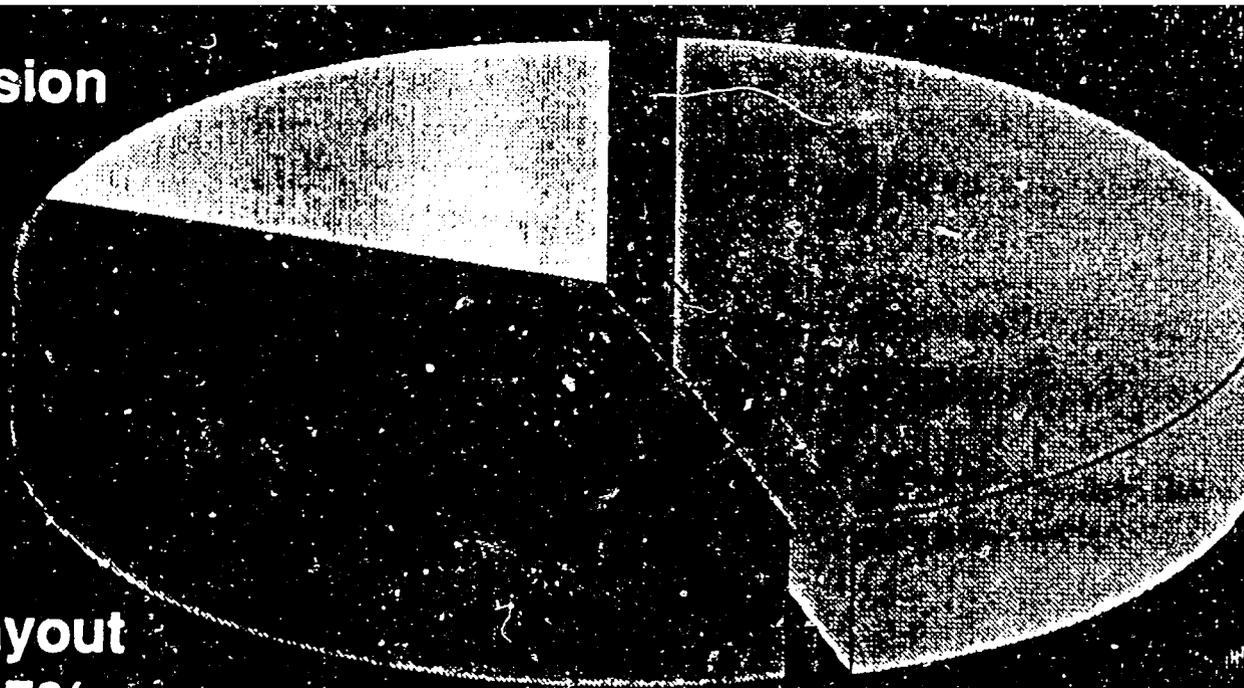
- **Engineering Design**
- **Solid Modeling**

CAD/CAM... The Overall Conversion Market

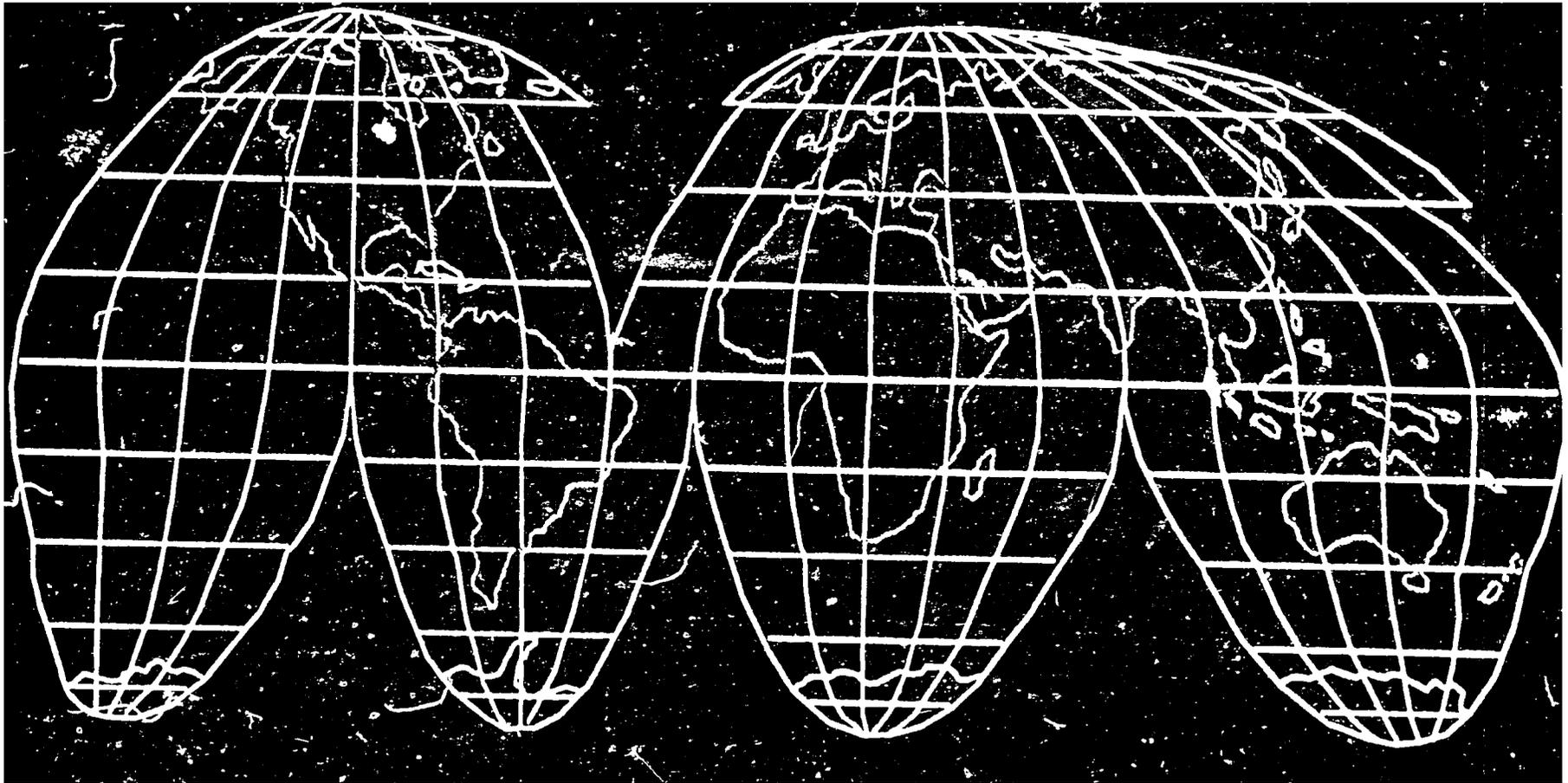
Conversion
20%

Layout
35%

Other Services
45%



Geographical Information Systems

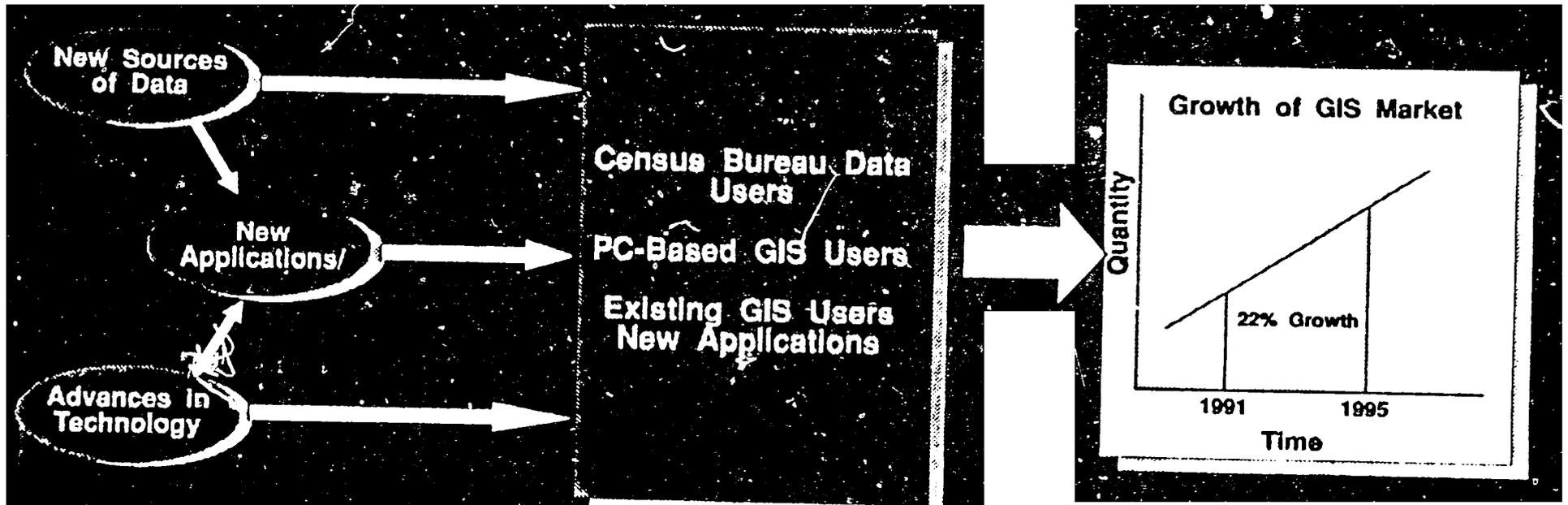


GIS...Overview

- **GIS is traditionally used to produce and access maps more efficiently**

- **New applications of GIS technology include:**
 - **Environmental planning**
 - **Analysis of census statistics**
 - **Compilation of demographic databases**
 - **Vehicle navigation systems**

GIS... Growth Drivers



GIS...Growth Drivers

Availability of New Data

- Topographically Integrated Geographic Encoding Reference System (TIGER Files) developed by U.S. Census Bureau and U.S. Geological Survey
- Satellite Imagery

Advances in Technology

- Distribution of data on CD-ROM
- Availability of PC-Based Systems
- Extended use of menu driven, user-friendly systems

New Applications

- Real-Estate
- Direct mail and sales
- Voter redistricting
- Oil and gas exploration
- Emergency services
- Transportation and traffic routing
- Utility companies

GIS.. Profile of Customers

Government Agencies

U.S. Geological Survey

NASA

U.S. Census Bureau

Bureau of Land
Management

Environmental Protection
Agency

Local Governments

Redistricting voter districts

Assessing property tax

Routing of emergency
vehicles

Controlling the spread of
diseases

Distributing welfare checks

Road and facility
management

Commercial

Oil Industry

Real Estate

Airline Industry

Long-haul Transportation

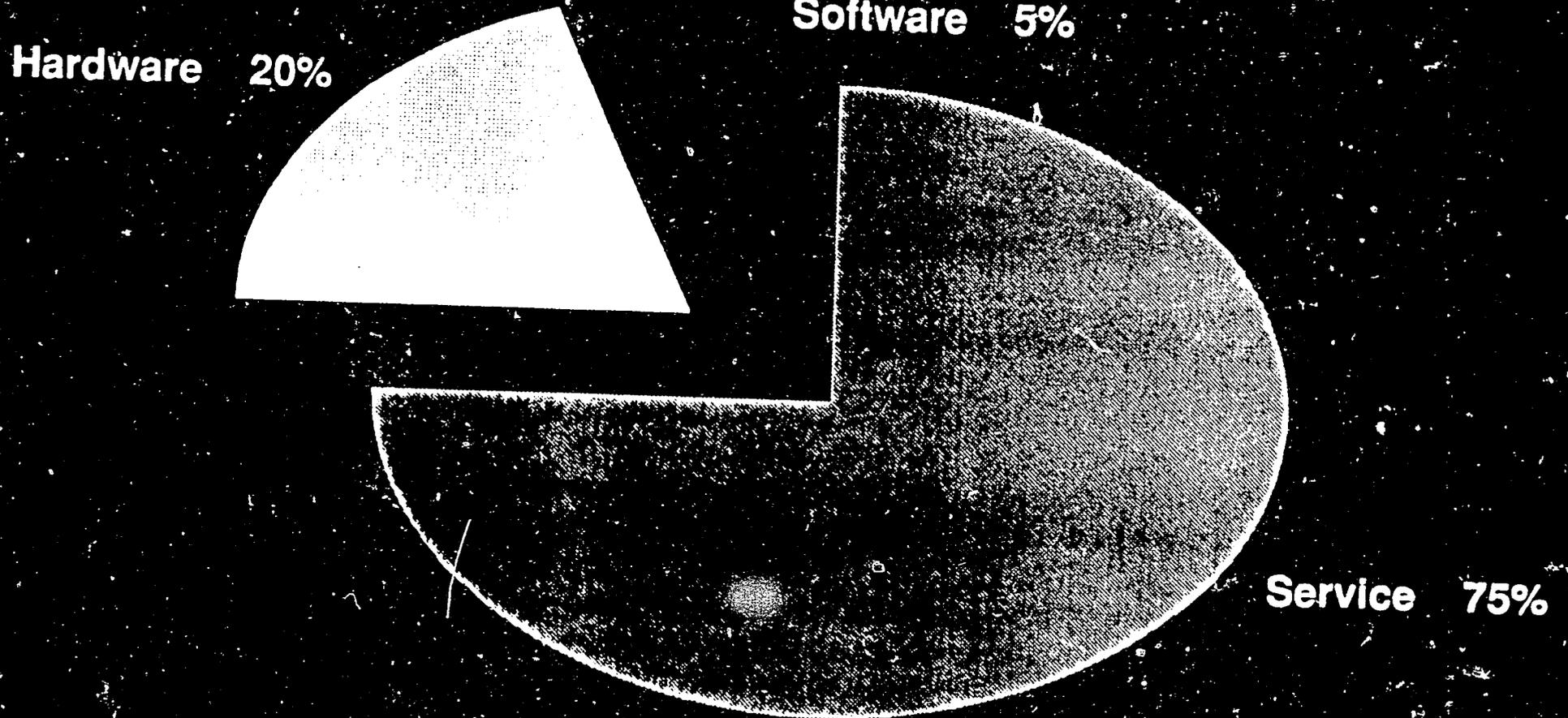
Farming

GIS... Examples of Applications

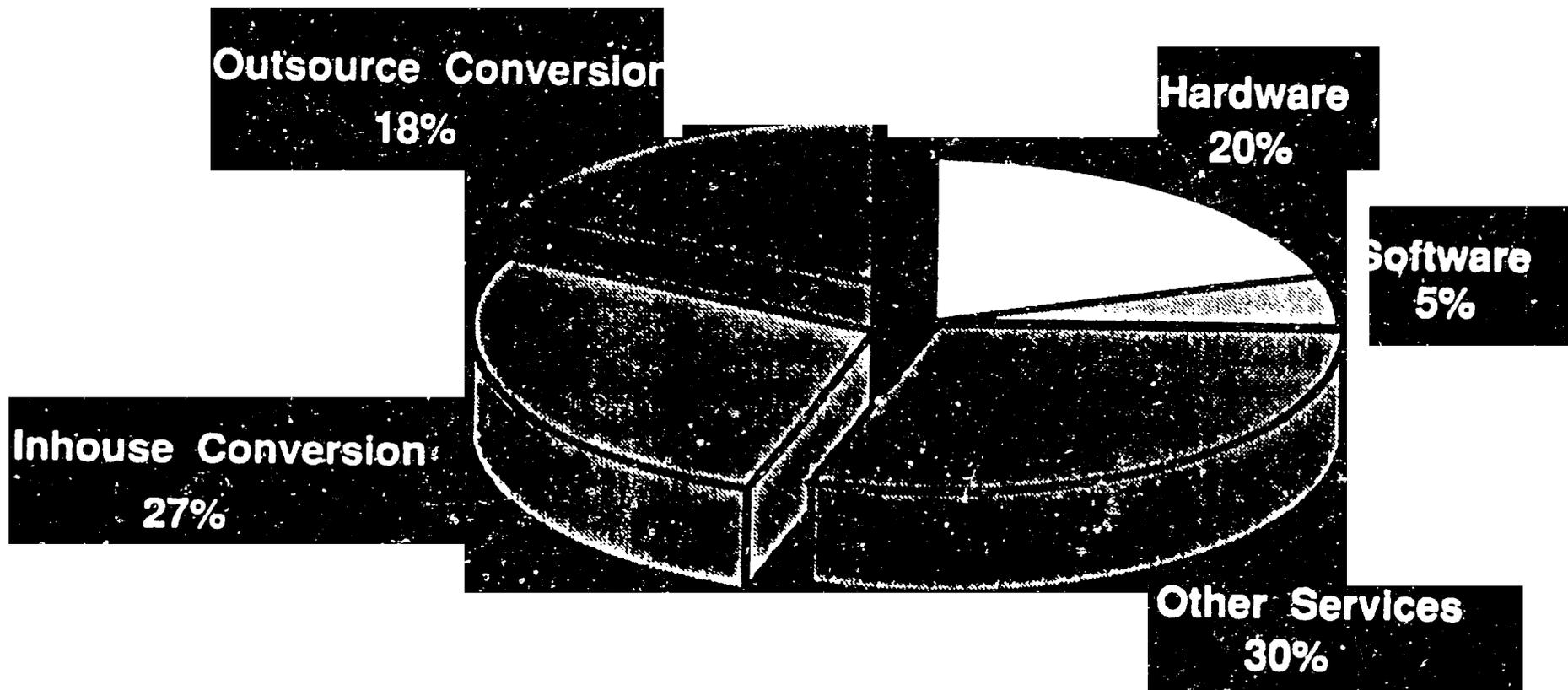
- **IBM was selected to provide the City of Newport News a GIS system that will eventually accommodate the planning, real estate, engineering, taxes assessment, public works, and other departments.**
- **Geographic Resource Solutions has been awarded a blanket contract to provide the California Department of Transportation conversion services for existing maps and design sheets to digital format using Intergraph software.**
- **Intergraph will provide the City of Troy, Michigan with implementation services for a computer-assisted dispatching system.**
- **Synercom will provide software as part of an integrated spatial solution for the Cincinnati Area Geographic Information Systems (CAGIS).**
- **Utility Graphics Consultant (UGC) has been retained by the Dallas Area Land Information System (DALIS) as the technical and management consultant for a multi-participant GIS study.**
- **City of Phoenix has selected ESRI's ARC/INFO software for its city-wide GIS implementation.**

GIS... Market Growth

The GIS Market by Segment (Total US\$ 5 Billion)



GIS... The Conversion Market



GIS...The Importance of Conversion

- **The poor quality of source material requires an interactive reconstruction process**
- **Automated Raster/Vector conversion is not fully refined, interactive editing and quality control are essential**
- **Processing, editing, and verification of map information is timely and requires trained personnel**

GIS...The Conversion Dilemma

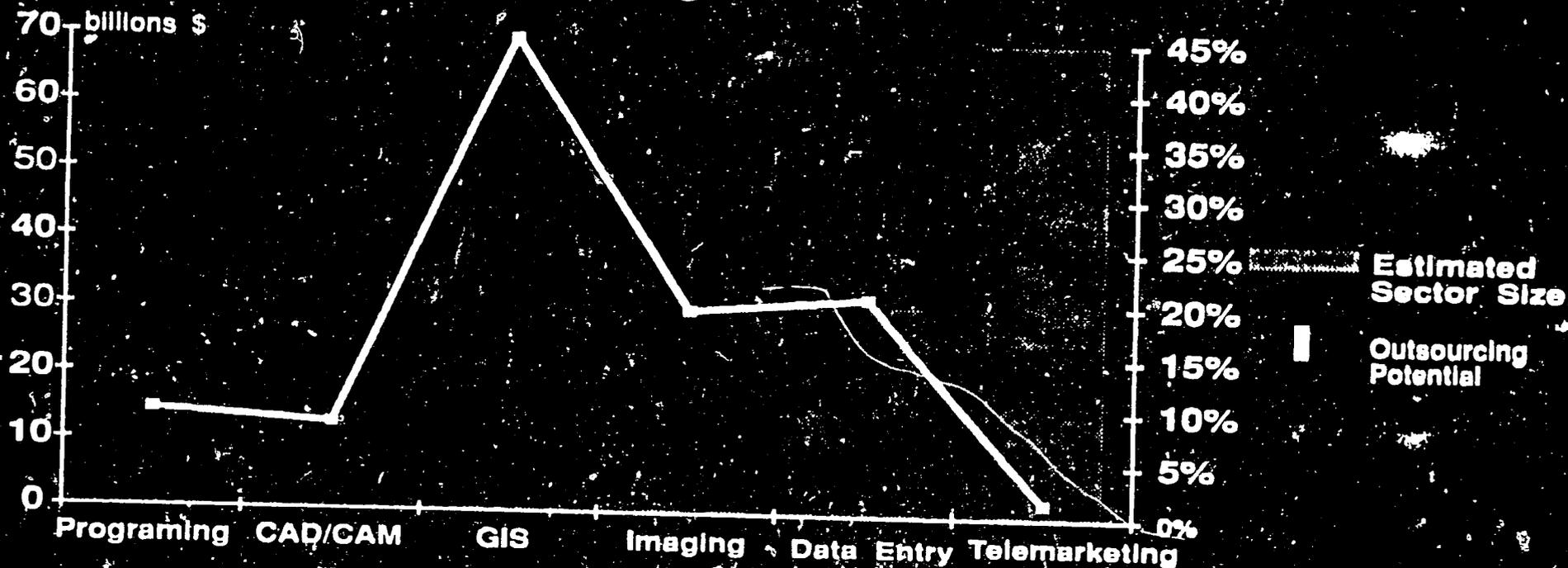
Example:

- **A typical electricity company covers an area of 20,500 Square Km, with 35,000 Km of overhead lines, and 50,000 Km of underground cable**
- **Nearly 65,000 maps are maintained -- different scales, locations, and types**
- **Cost to capture data is approximately \$100 per sheet**
- **At 5 sheets per man/day it would take 13,000 man/days, or 43.22 man years**
- **Even if a certain percentage of maps are digitized, there is a significant market.**

Summary

Summary.. Offshore Information Processing Potential

Estimate of Sector Sizes and Outsourcing Potential

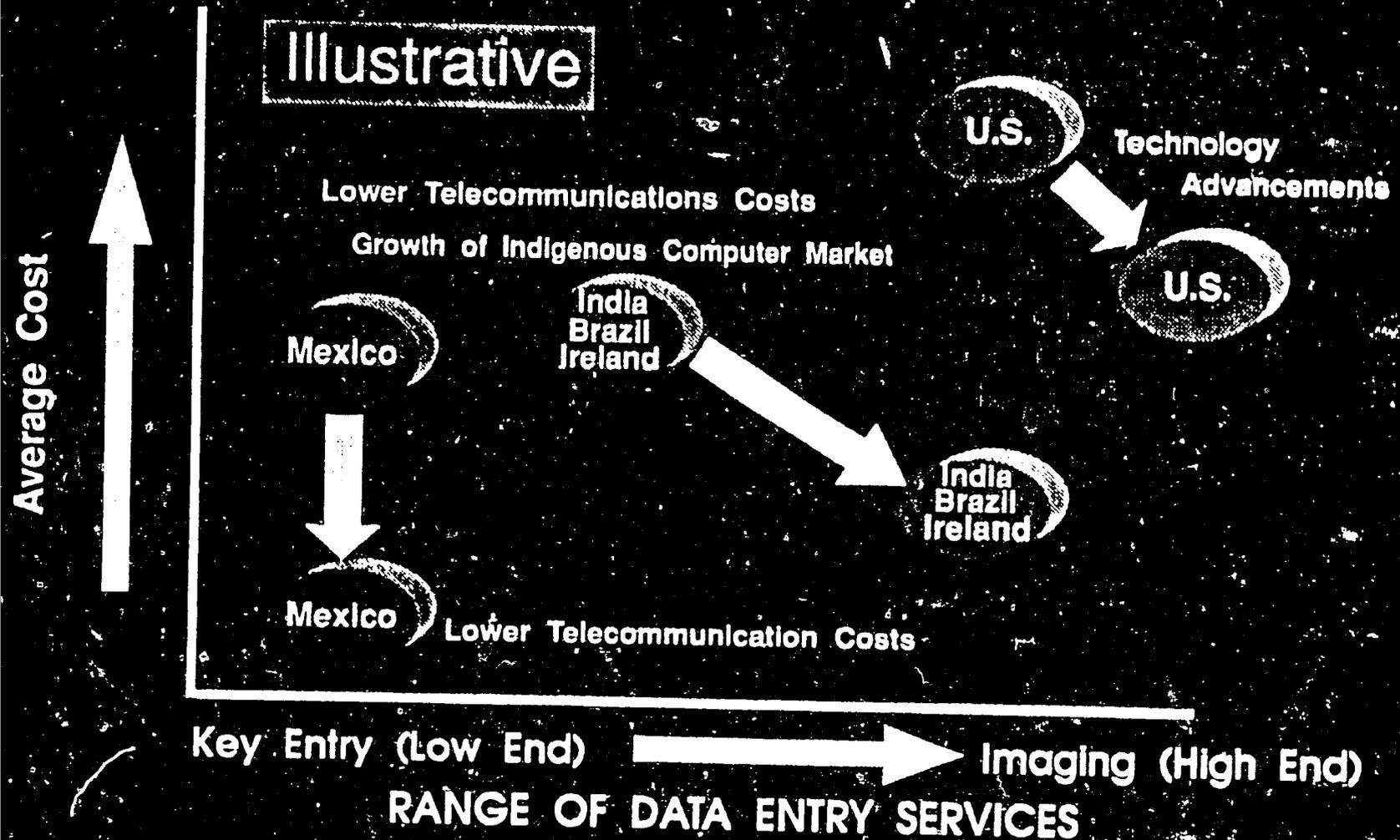


- The information processing market in the U.S. is healthy and growing in all segments
- There is a large demand for outsourcing services

Summary...Competitive Trends

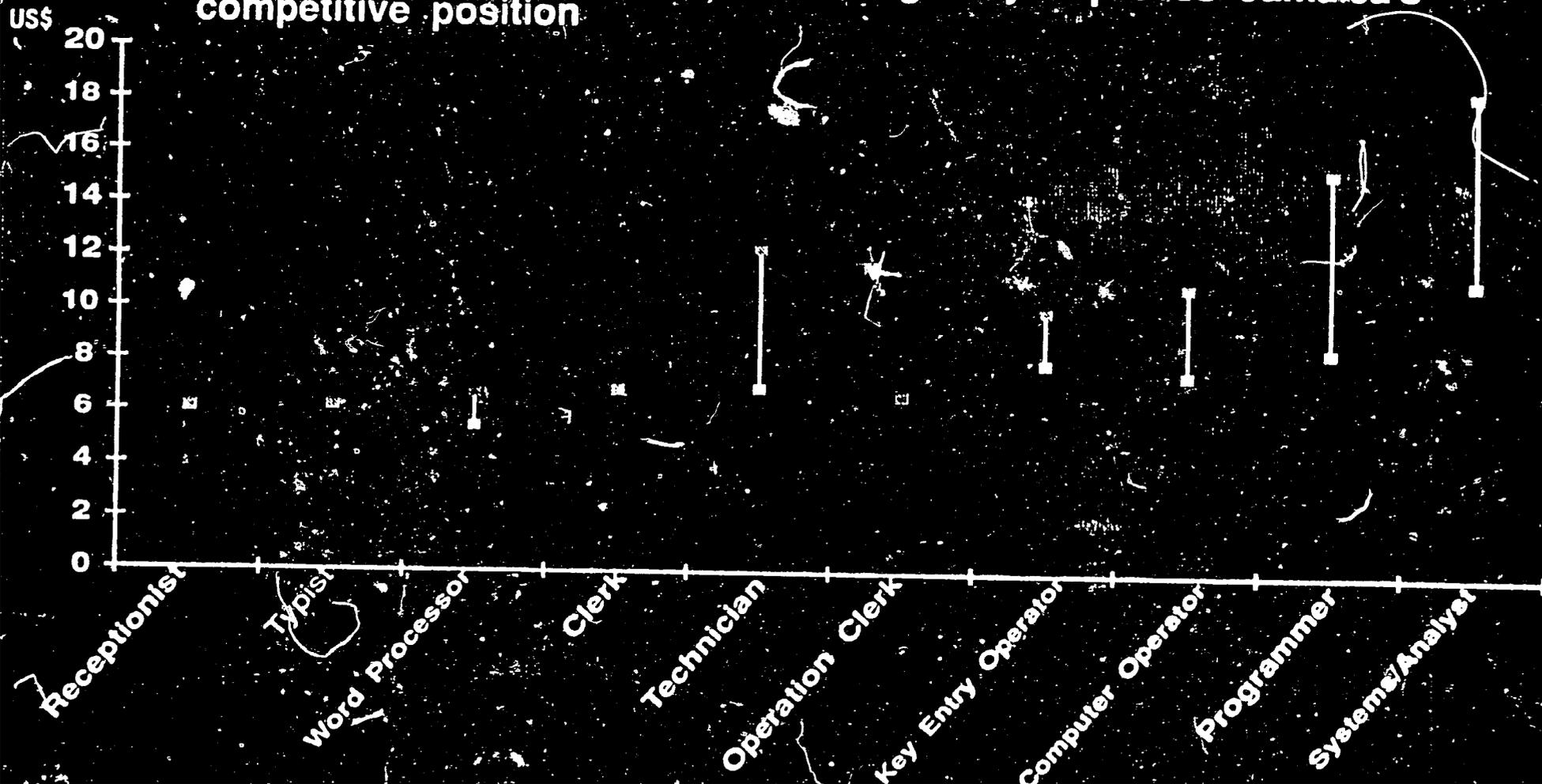
- **New technologies are changing the nature of information processing**
- **Telecommunication reduces the importance of geographical proximity**
- **Competition will increase from within the U.S. and other developing nations**
- **Jamaica has a limited indigenous industry-base compared with its competitors**

Summary...Competitive Trends



Summary... Comparative Labor Cost

- Jamaica has a well-educated trained labor force
- The decline of the Jamaican dollar greatly improves Jamaica's competitive position



Recommendations.. A Three Tier Strategy to Maximize Benefits

- **Expand in market niches where Jamaica is already strong**
- **Promote information processing applications in the home market**
- **Diversify to higher-end markets/services**

Expansion

Diversification

Application to Home Market

The First Tier...Expansion Existing Market Niches

■ Objectives:

- **Form cooperative marketing efforts**
- **Allocate work received in efficient and equitable manner**
- **Provide sufficient work to utilize a minimum capacity of each member**
- **Establish unilateral pricing schemes**
- **Implement quality control standards**
- **Maintain a self-sufficient group, use profits for training and education**

■ Benefits:

- **Minimize counter-productive competition**
- **Utilize economies of scale, share costs and resources**
- **Promote industry wide training and management programs**
- **Improve follow through and response to leads**

Cooperative Effort... Advantages and Disadvantages

Advantages

- Gaining economies of scale - reduction in individual cost and effort
- Self-promotion of much larger jobs
- Gains in technological awareness from cooperation
- Less secrecy and greater sharing of information
- Realization of greater industry and individual earnings
- Pooling of capital labor and technology, accommodating diverse client needs.

Disadvantages

- Reduction of independence
- Requires coordination and cooperation
- Difficulty of equitably allocating work
- Uncertain allocation of the fruits of joint marketing efforts vs. individual efforts
- High cost of monitoring and maintaining group quality
- Potential of misappropriation of time and effort in the mediation of grievances

The Second Tier...Application in Home Market

■ **Objectives:**

- **Promote office automation, within Jamaica**
- **Remove tax barriers, enable easy access to equipment & telecommunications**
- **Provide service to local industries**
- **Establish incentives to boost training and investment in technology**

■ **Benefits**

- **Increases efficiency within industry and government agencies**
- **Create a home market to alleviate foreign market downturns**
- **Form strong local expertise**

The Third Tier...Diversification

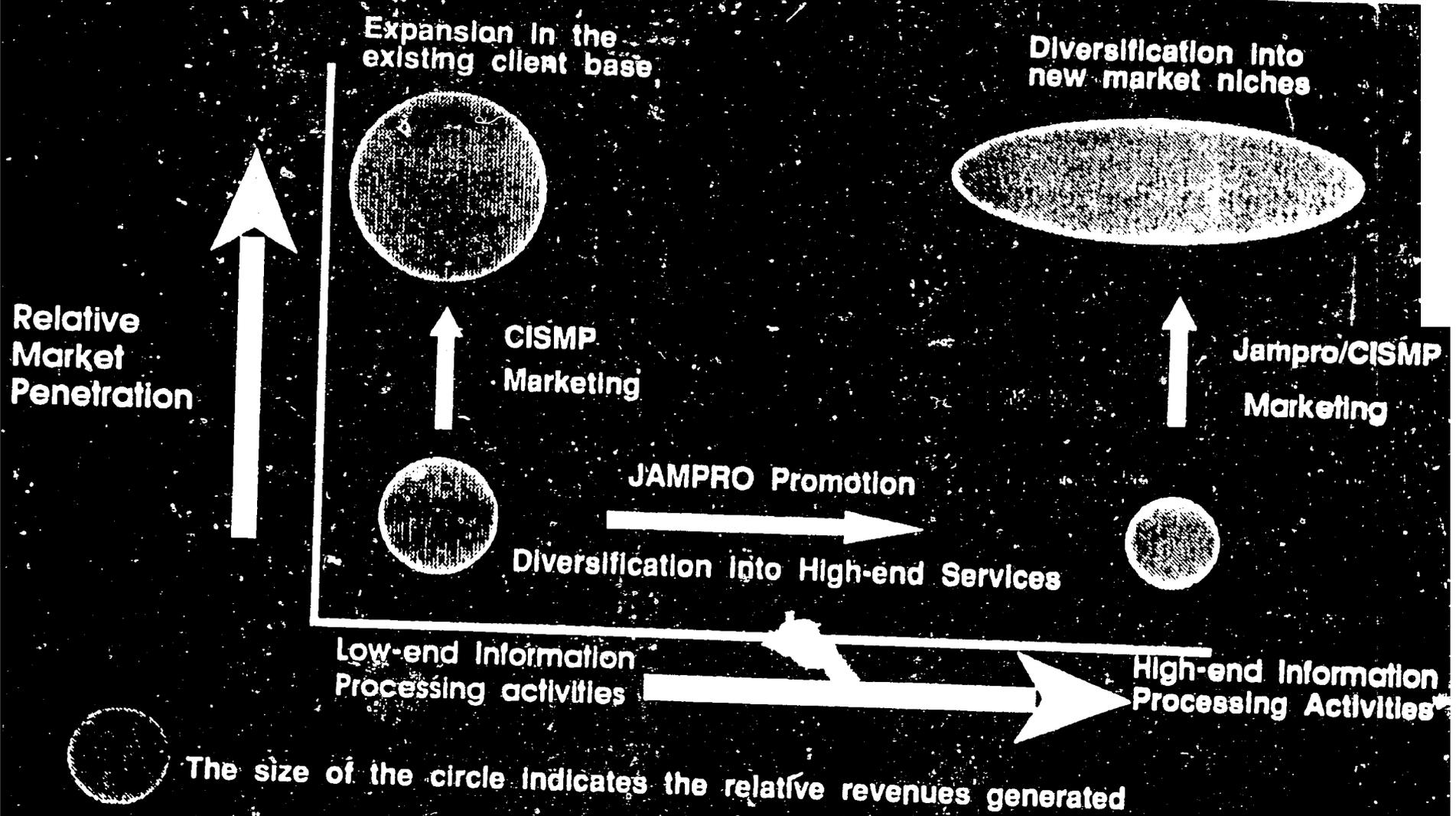
■ **Objectives:**

- **Promote strategic partnerships in GIS, CAD/CAM, Imaging, and Programming**
- **Jamaica's "brand-name" well established, strengthen that positive image**
- **Jampro's involvement essential to provide credibility, coordination**
- **Package value-added solutions for computer manufacturers, suppliers, etc.**
- **Attract firms not only for low cost labor, but also high quality, and value added services**

■ **Benefits**

- **Penetrate U.S. market segments not already accessed**
- **Migrate towards new technologies**
- **Build the foundation for the high-end niche services**
- **Use the existing areas of expertise as a "spring-board"**
- **Attract investment in new technologies and plants**
- **Offset Jamaica's lack of large indigenous industry**

Recommended Diversification/Expansion Strategy



Coordination of Cooperative /Strategic Marketing

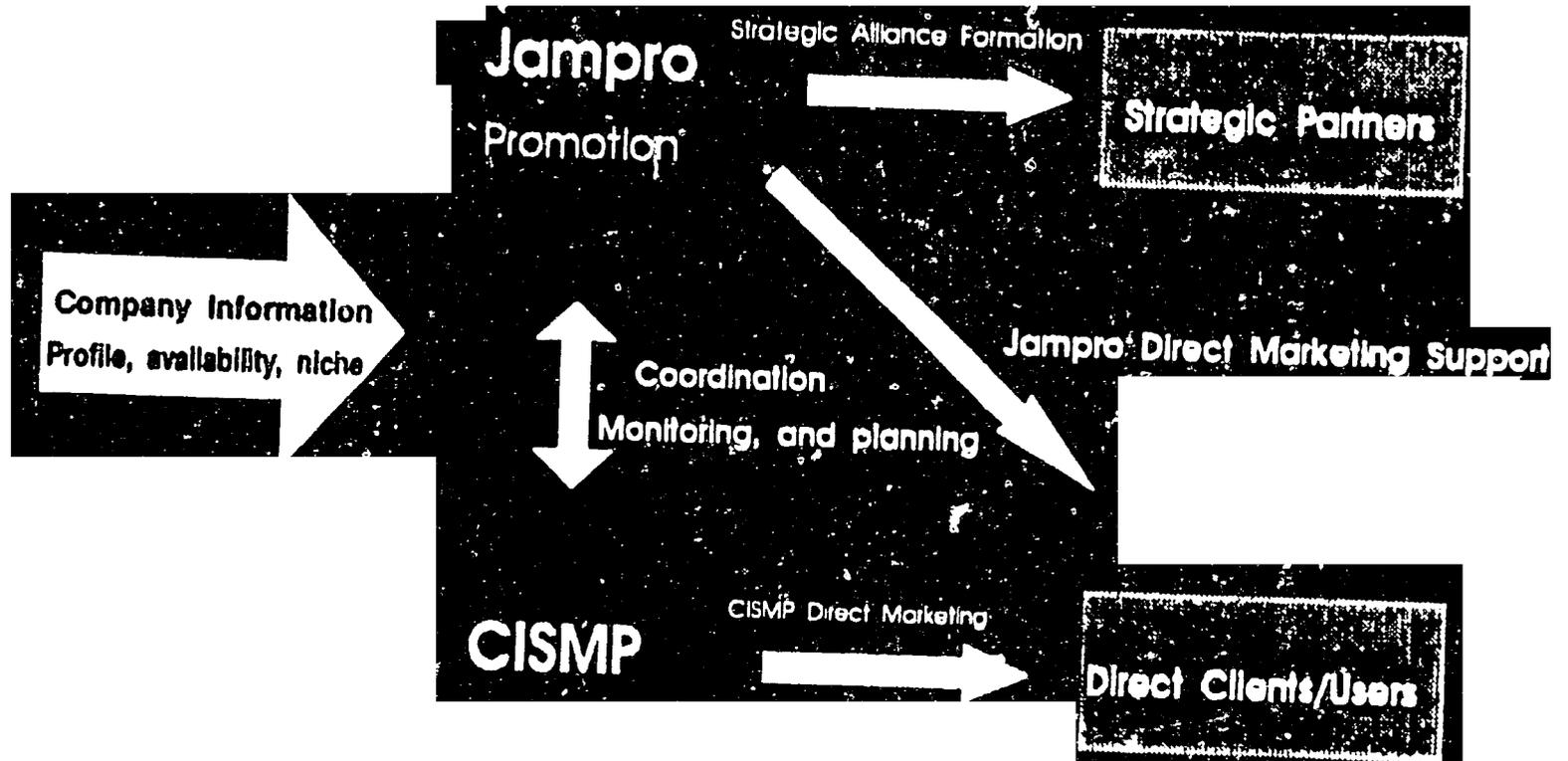
Local Jamaican Firms

Company A

Company B

Company C

Company Z



Springboard Approach.. Maximizing Existing Experience

- Key-entry serves as a baseline expertise for all other sectors
- Programming supports the other sectors and is used as an export service
- GIS, CAD/CAM, and Imaging utilize Programming and Key-entry expertise

Telemarketing

Programming

Imaging

CAD/CAM

GIS

Data Entry