

INPUT[®]

**IMPACT OF CD ROM
ON INFORMATION SERVICES**

**Graham Kemp
Vice President
INPUT**



THE MEDIUM . . .

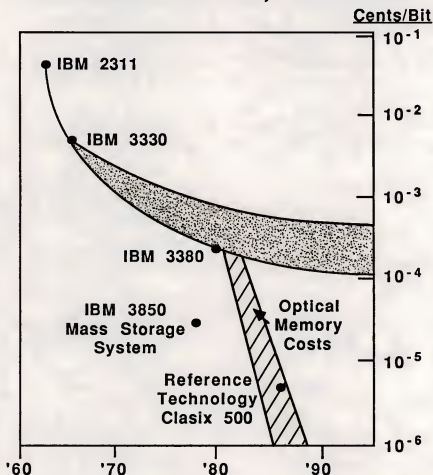
- Resistant (Dirt, Heat, Scratches)
 - Resilient (To Drops, Head Crashes)
 - Unparalleled Error Correction
(1 in 10³ → 1 in 10¹²)
 - Can Be Mailed With Impunity
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THE STORAGE . . .

- Data (550 MB)
 - Text (150,000 Pages)
 - Images (15,000)
 - Sound (2 Hours)
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OPTICAL VERSUS MAGNETIC DISK
STORAGE COSTS, 1960-2000

THE PRODUCTS . . .

- Drives
 - Workstations
 - Software/Applications
 - Data/Subscriptions
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NEGATIVES . . .

- **No Write/Erase/Edit (Yet)**
 - **Slow Access (1/2 to 1 Second)**
 - **Difficult to Backup**
 - **Expensive (But Getting Cheaper)**
 - **Slow Turnaround for Data Disks
(But Improving)**
-



BARRIERS TO MARKET PENETRATION

- **Lack of Standards**
 - **Hardware**
 - **Software**
 - **Start-up Costs Are High**
 - **CD ROM Is Expensive**
 - **Data File Creation Is Expensive**
 - **User-specific Interfaces Needed**
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MULTIMEDIA CAPABILITIES

- **The Most Explosive Potential Offered by CD ROM**
 - **Realistically a Small Opportunity for Now: No Established Expertise, Very Costly**
 - **Some Scope for Text/Data, Image/Menus with Sound Over**
 - **Best Market: Educational Tools**
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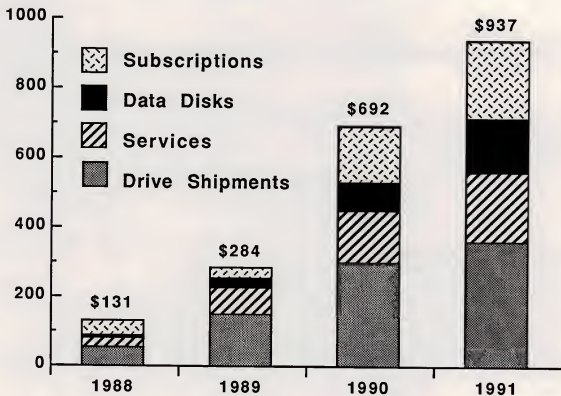


CD ROM MARKETS: SOFTWARE DEPENDENT

- **CD ROM Personalizes Data Base Use Like the PC Personalized Information Processing**
 - **Main Added Value: Specific, User-profile/
Data Content-oriented Search Capabilities**
 - **Generic Search/Index Software Available**
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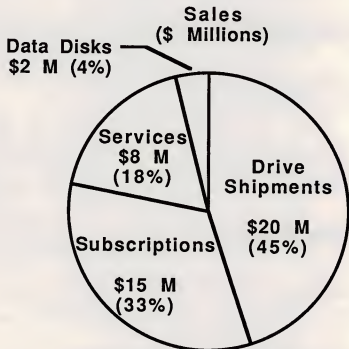


CD ROM MARKETS, 1986-1991





**PERSONAL COMPUTER CD ROM
MARKETS, 1987**

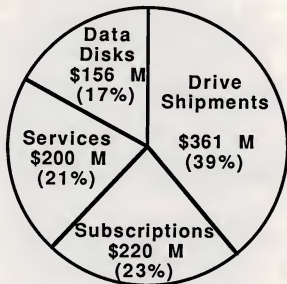


1987 Total: \$45 Million



**PERSONAL COMPUTER CD ROM
MARKETS, 1991**

**Sales
(\$ Millions)**



1991 Total: \$937 Million

CD ROM: "VIDEOTEXT" OR "PC" MARKET?

"Videotex-like"

- War among Vendors for Standards
- A "Revolution" Still Waiting to Happen

OR

"PC-like"

- Personalization of Storage
 - Software-driven
 - Explosion of Dealers, Vendors, and Products
-

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that this is essential for ensuring transparency and accountability in the organization's operations.

2. The second part of the document outlines the various methods and tools used to collect and analyze data. It highlights the need for consistent data collection procedures and the use of advanced analytical techniques to derive meaningful insights from the data.

3. The third part of the document focuses on the challenges and risks associated with data management. It identifies common pitfalls such as data loss, security breaches, and inconsistent data quality, and provides strategies to mitigate these risks.

4. The fourth part of the document discusses the role of data in decision-making and strategic planning. It explains how data-driven insights can help organizations identify opportunities, optimize processes, and make informed decisions that drive growth and success.

5. The fifth part of the document provides a summary of the key findings and recommendations. It reiterates the importance of a robust data management strategy and offers practical advice on how to implement and maintain such a strategy effectively.

6. The sixth part of the document includes a list of references and sources used in the research. It provides a comprehensive overview of the literature and resources that informed the analysis and conclusions presented in the document.

7. The seventh part of the document contains a list of appendices and supplementary materials. These materials provide additional details and data that support the main findings and conclusions of the document.

8. The eighth part of the document includes a list of figures and tables. These visual elements help to present complex data in a clear and concise manner, making it easier for the reader to understand the key findings and trends.

9. The ninth part of the document contains a list of footnotes and endnotes. These notes provide additional information and clarifications related to the main text of the document.

UNDERSTANDING CD ROM APPLICATIONS

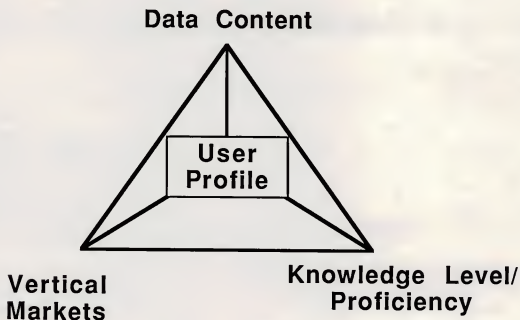
- Data Content Dependent

 - Not Time-sensitive

 - Large Audience
 - Focused Groups of Professionals
 - Narrow Functionality
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CD ROM APPLICATIONS





WHERE ARE THE CD ROM APPLICATIONS?

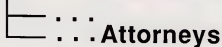
Sector

Other Industries



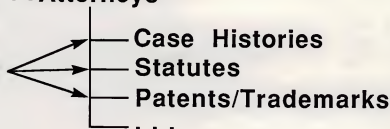
81

Legal Services



Attorneys

CD ROM



Case Histories

Statutes

Patents/Trademarks

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CD ROM SOFTWARE OPPORTUNITIES

- **Pre Retrieval**

- **Knowing What to Ask**
- **Knowing How to Ask It**
- **Interfacing with User in User's Terminology**

- **Post Retrieval**

- **Application-specific Processing of Retrieved Information**
 - **Current Software MAY Be Adaptable**
-



**EXAMPLE OF CROSS-INDUSTRY APPLICATION
FOR INDUSTRY-SPECIFIC MARKETS**

- **Sample Tool:** CD ROM-based Street Map

 - **Applications:** Sales Territory Assignment/
Call Planning, Market Analysis
for Siting 24-hour ATM, Taxi
Dispatching, Electrician
Service Call Sequencing, etc.
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**PRE RETRIEVAL, POST RETRIEVAL,
AND WAYFINDING**

- **Intelligent Indexing**
 - **Application-Specific Processing**
 - **Navigating**
-



**CD ROM - A MARKETING AND
COMMUNICATIONS TOOL**

Marketing

- **Cut Costs**
- **Improve Information Distribution**

Communications

- **Unlimited Access to Semipermanent Information, Data and Text**
 - **Off-load Mainframe Real Time Queries**
-



CD ROM: MARKETING TOOL

Example

- **Drug Manufacturers: Spend \$20K/Yr. on Each of 175,000 Physicians Writing Prescriptions**

- **One CD ROM Disk Could Deliver All of the Information Contained in 4,500 Medical Journals That Target This Tiny Distribution Channel**



CD ROM: COMMUNICATIONS TOOL

- **Controlled Release of Large Volumes of Information to Broad Audience**
- **Look up/Reference Search/Authorization**
- **Examples: Pricing Lists, Maintenance Procedures, Engineering Diagrams, Standards**



**ROLE ASSIGNMENT AND INTEGRATION:
CRUCIAL TO MARKET DEVELOPMENT**

- **Product Manufacturers Are Not the Best . . .
Software Designers, Who Are Not the Best . .
Application Programmers, Who Are Not . . .
. USERS!!**
-



**CD ROM HARDWARE PRICES:
TEMPORARY BARRIER**

- **Prices, in Volume, Have Fallen from \$1,200 to \$500 in One Year**
- **Expect a 20%/Annum Erosion over Next Three Years**



IMPACT OF CD ROM ON INFORMATION SERVICES VENDORS

- **Opens Markets for PC Reference Storage Applications and 3rd Level SIC Workstations**
 - **Impacts:**
 - **Hardcopy Publishing/COM**
 - **Software Developers (New Markets)**
 - **Turnkey System Vendors (New Markets)**
 - **RCS/OLDB Vendors (Hybrid Systems)**
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CD ROM IMPACT ON PROCESSING SERVICES

- **Positive:**

- **New Hybrid Services (\$525 M: 1991)**
- **WORM Back-up Services**

- **Negative:**

- **Online Data Base Services (\$60 M: 1991)**
- **COM Services (\$40 M: 1991)**

- **No Impact on Facilities Management**



MINIMAL SELF IMPACT

- **CD ROM Impact Fear Largely Unfounded**
 - **Online Data Base Services Have Not Impacted Sales of Print Products (in Some Cases They Have Risen)**
 - **Usually Control of the Data Is in the Hands of Publisher/Online Service Vendor**
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CD ROM IMPACT ON RCS

- Nil on Real Time Applications
- Potential Impact on Archival/Historic Reference Data Base Services
- Hybrid Services Will Encourage RCS Use, On-site Hardware Services



CD ROM VERSUS ONLINE DATA BASE

ITEM	OLDB	CD ROM
User Interface	Generic	Specific
User Type	Many	Single
Cost	Unpredictable	Fixed
Access	Short/Specific	Relaxed/T&E
Data Update	Daily	Quarterly



CD ROM IMPACT ON TURNKEY SYSTEMS

- **Big Opportunity for Customized Turnkey, Workstation-oriented Systems:**
 - **CD ROM Upgrades of Existing Systems**
 - **New CD ROM Systems**

- **Business/Professional Markets the Main Targets, Consumer Markets Later**



CD ROM IMPACT ON TURNKEY SYSTEMS

- **Barrier to Growth Is Specialist Knowledge of 3rd Level SIC Markets**
 - **New Opportunities That Expand Current Markets, Add New Markets**
 - **CD ROM Manufacturers Will Look to Sign-up Dealers/Distributors with Software/Applications Expertise**
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THE UNIVERSITY OF CHICAGO

IN THE DEPARTMENT OF CHEMISTRY

BY

TURNKEY VENDORS MUST . . .

- **Explore Multimedia Possibilities in Markets Currently Served**

 - **Watch for Successful Startups Who Get a Foothold in Vertical Markets that Have Strategic Relevance to You**
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CD ROM IMPACT ON SOFTWARE MARKETS

- **Software Building Blocks Are Needed:**
 - **Operating System, I/O**
 - **Data Base Management**
 - **Utilities/File Conversion**

 - **Menu-driven Applications, with Specific User Profiles, Require Teaming of Software Specialists, System Designers and Applications Specialists**
-



**CD ROM IMPACT ON
SOFTWARE PRODUCTS MARKET**

- **Largest Opportunity Is in Microcomputer Software: 5% of All Micro Software in 1991 Will Need to Be Able to Handle CD ROM Files**

 - **CD ROM Is First in Long Line of PC Optical Storage Media that Will Generate \$3 Billion of New Revenues by 1995**
-



**CD ROM IMPACT ON
PROFESSIONAL SERVICES**

- **New Markets Based on Expert Systems
Design Knowledge in Vertical Markets**
 - **Customized Software Development for
Applications in Fortune 1000 Companies**
 - **Less than 1% of \$32 Billion Professional
Services Market in 1991**
-



NET IMPACT OF CD ROM ON INFORMATION SERVICES

SERVICE DELIVERY MODE	NET IMPACT (\$ M)	
	1986	1991
Processing/Network Services	*	\$425
Software Products	*	610
Turnkey Systems	*	800
Professional Services	*	265
Total	(Small)	\$2100

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. This not only helps in tracking expenses but also ensures compliance with tax regulations.

In the second section, the author provides a detailed breakdown of the company's revenue for the quarter. It includes a comparison between actual performance and the budgeted figures, highlighting areas where the company exceeded expectations and where it fell short.

The third section focuses on the company's financial health and liquidity. It analyzes the current cash flow and identifies potential risks that could impact the company's ability to meet its short-term obligations. Recommendations are provided to mitigate these risks and improve overall financial stability.

Finally, the document concludes with a summary of the key findings and a forward-looking statement. It expresses confidence in the company's ability to achieve its long-term goals, provided that the management team continues to implement the strategies outlined in the report.

ADOPTION OF CD ROM HINDERED

- **Limited Marketing Strength of CD ROM Vendors, Absence of IBM**
 - **User Inertia**
 - **Limited Software Availability**
 - **Extensive Hand-holding Needed**
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**CD ROM MARKET PENETRATION
WILL BE SLOW**

- **User-profile/Data-specific Knowledge Is Scarce**
 - **Information Providers Cautious**
 - **Heavy Start-up Cost for Applications**
 - **Standards Still a Problem**
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CONCLUSION

- **Fear and/or Greed Factor Is Missing So Far**
 - **The Best Thing that Could Happen to the Market Is for One Large User Company to Be Very Successful in Implementing CD ROM**
 - **Most Market Leaders Are (So Far) Small Companies**
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CONCLUSION

- **CD ROM Needs the Same "Creative Explosion" Support as the PC to Achieve Its Full Potential. Without It, CD ROM Will Languish**

 - **CD ROM Is First in Long Line of Optical Storage Products that May Ultimately Replace Magnetic Storage.**
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2011-2012

1. Introduction

2. Objectives

3. Methodology

4. Results

5. Conclusion

6. References

7. Appendix

CD ROM MARKETS, 1986-1991

