

# Document Management, Document Imaging

## Document Management, Document Imaging

3 Days: Thursday, September 30, 1:00 PM to 9:00 PM, Friday, October 1, 10:00 AM to 8:00 PM, and Saturday, October 2, 1999, 9:00 AM to 5:00 PM

Course 814.14, Reg#D7804U, on the UCLA Campus, Department of Engineering, Information Systems & Technical Management (EISTM), UCLA Extension, +1 (310) 825-4100

Grading: 2.1 CEU (Continuing Education Unit); no grade assigned

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## Daily Schedule

Day 1	Day 2	Day 3
• 1 - A	• 2 - A	• 3 - A
• Break	• Lunch	• Break
• 1 - B	• 2 - B	• 3 - B
• Dinner	• Break	• Lunch
• 1 - C	• 2 - C	• 3 - C
• Break	• Dinner	• Break
• 1 - D	• 2 - D	• 3 - D

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Day/Part	Slide	Topic
1 - A	A - 8	First Principles
1 - B	A - 50	Scanning / Printing
1 - C	A - 121	Importing / Preserving Files
1 - D	A - 227	Index / Search
2 - A	A - 243	Store / Purge / Preserve
2 - B	A - 320	Communications / Workflow
2 - C	B - 11	Display
2 - D	B - 28	System Design
3 - A	B - 70	Environment / Specialization
3 - B	B - 136	Records Management
3 - C	B - 213	Request for Proposal (RFP)
3 - D	B - 268	Paradigms, References, & Future

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# Workflow

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## Workflow

- Document Routing
- Structured vs Ad Hoc in Same System
- Proprietary vs Commercial Email
- Is Routing Setup Graphical?
- Can You Find In-Process Documents?
  - Even when you delete the node they are enqueued for?

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## Workflow Functions (1)

- Workflow Metadata Management
- Synchronization Points
- Ad Hoc Activities
- Purge, Archive, Delete
- Names and Roles
- Error Reporting and Control
- Security, Locking, Process Integrity

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## Workflow Functions (2)

- Subprocess (Workflow Subroutine)
- Transition Condition
- Workflow Process / Activity / Instance
- Manual Process / Activity / Instance
- Worklist (Queue)
- Workflow Control Data
- Workflow Monitoring

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## Workflow (1)

- Dependent on Email System Integrity, or Independent Database
- Client Ability to Interrupt One Document Process to Handle a Higher Priority Document
- Ability to Find a Document Anywhere in the Workflow System

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## Workflow (2)

- GUI Workflow Editor
- Ability to Change Workflow On-the-Fly
- Automatically Identify Documents That No Longer Have a Destination in the System

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## Workflow (3)

- Manage Queue Length
- Manage Length of Time Each Document Spends in the System
- Reroute Documents from an Administrative Terminal

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# Display

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## We Process Vision on Three Channels

- Resolution
  - Text
- Color
  - Is there a red editing mark on this page?
- Motion
  - Instinctive mouse movement to locate cursor
- The channels can be manipulated independently
  - Optical illusions

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## What Do We See? (Hear?)

- How often is a theater screen completely black?
- Why do people take flash photographs of screens?
- Where does the image on a computer screen come from?
- What does this phrase commonly mean: "To see the the light?"
- Why does reading backwards help?
  - Answer: Start here, read back four lines.
- Why is a blind spot not a spot?
  - Because it does not exist.
    - It is outside a person's universe, perception, paradigm.
    - As a spot it fits in a one paradigm paradigm.

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## Workstation Issues

- Black & White/Greyscale/Color
- Resolution: 1024 x 768 to 1600 x 1200 (pixels)  
(Horizontal x Vertical)
- Bits per Pixel: 1, 8, 16, 24 (bits)
- Refresh Rate: 60, 66, 72, 80, 85, 120 (Hz)
- VGA Cable to Monitor
- Power Saver

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## Displays

- 1600x1280 (horizontal first x vertical)  
[1800 x 1440 x 70 Hz Available]
- 85 Hz Vertical Refresh(88 Hz is Cornerstone)
- Analog input is 24 bit color (VGA cable)
- Video clock frequency 220 MHz (pixel rate)
- Auto sync range (31 [VGA] - 107 KHz)  
(horizontal frequency)
- 20 inch diagonal (viewable) (Also called 21 in.)
- .22 mm horizontal dot pitch
- **The picture must be bright** (And have a power saver.)

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## Pixels per Inch

vs

## Pixels per Image

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## Pixels per Inch / Pixels per Image

- Pixels per Inch
  - Used in scanned and printed documents
  - Number of pixels depends on the image size
- Pixels per Image
  - Used in displays and scanned photographs
  - Number of pixels is fixed
  - Number of pixels is independent of image size
  - Used in television (smaller screen appears sharper)

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## Color Perception

- We process visual input via three discreet paths.
  - Resolution (black and white)
  - Color
  - Motion
- Manipulating the input for these three paths independently is the foundation for optical illusions.

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## Number of Pixels Displayed

- Computer Display
  - 21 inch (525 mm), 1600 by 1200 pixel resolution
  - Displaying an 8 1/2 by 11 inch letter size page
- How many of the scanned pixels are displayed?
  - What percentage?
  - How many pixels seem to be displayed?
  - Scale to gray

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## Accommodating Disabilities

- Librarians, archivists, and museum curators have a professional responsibility to accommodate disabilities.
- Systems should be created that produce individualized color shifts for each colorblind patron so that each person can see images with the best possible color fidelity.
  - 256, thousands, and millions of colors display controllers are examples of such a color mapping, as are GIF images.
  - User profiles can have a color perception map added by simply presenting a color perception test to users at their first logon.
  - When necessary, the provenance of a displayed image can include a color space transformation to match the color gamut available to each color blind patron.

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## Windows 98 and Displays

- Microsoft Windows 98 Supports up to 8 Displays
  - Useful for Cubic Surround Vision (Especially Games)
    - Front (3), Back, Left, Right, Above, Below
- For Document Imaging
  - A 1280 x 1024 Color Monitor for Command Windows
  - A 2048 x 1500 Black & White Monitor for Heads Down Work

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## Viewing Features / Capabilities

- Multiple Documents
- Multiple Pages
- Multiple Layers (Drawings, GIS)
- Reference Window
- Pan, Zoom, Scroll, Roam
- Table of Contents
- Measurement (Drawings, GIS)
- Annotation
- Redline
- View Length and Width of Page
- Thumbnails
- Magnifier

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# Edit

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## Document Imaging System Features

- Import/Export Formats Supported
- Annotation (no standard for export)  
[Most from Spicer and Watermark]

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# Document Management, Document Imaging

## Image Clean Up

- Bates Numbers
- Deskew
- Despeckle
- Crop
- Resize
- Rotate
- Invert Black/White
- Mirror
- Merge
- OCR

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## Edit Feature Settable Attributes

- Color
- Font
- Fill Types
- Line Styles
- Line Thickness
- Object Placement
- Polygon Cut/Copy/Paste

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## Markup / Annotate

- Sticky Note
- ActiveX Object
- Sound
- Drag and Drop
- Annotate Text
- Arrow
- bind
- Box
- Circle
- Copy
- Cut
- Delete
- Dimension
- Ellipse
- Erase
- Highlighter
- Hotspots
- Line
- Modify
- Move
- Paste
- Polygon
- Polyline
- Redact Black/White
- Redo
- Resize
- Rotate
- Rubout
- Shader
- Sketch
- Symbols
- Text
- Unbind
- Undo

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## System Design

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## Change

- Are you subconsciously planning for the Internet to stay pretty much the way it is today?
  - Today a single fiber can carry 320 Gbits (40 GBytes) per second
- Are you planning your systems for what was **or for what will be?**
- A 256 MByte computer has 2 billion transistors
  - Is this twice as good as a 1 billion transistor computer?
    - Weren't 9 transistor radios better than 7 transistor radios?

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## Costs that Disappear from Our Radar Screen

- Soon, some costs will not be a consideration
  - The cost of storage
  - The cost of transmission
- Has this happened before?
  - The cost of a glass of water
  - The cost of Internet messages
  - [Digital watches]
  - A US \$1 railroad ticket from St. Louis to LA
    - How do we know costs will not go back up?

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## Preliminary System Sizing Exercise

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## System Design Sizing Assumptions

- 1 Page = 50 KBytes when Stored
- 1 File Cabinet (4 Drawer) = 10,000 Pages
- 1 File Cabinet = 1 CD ROM (1/2 GByte)

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## Storage Required (and Cost)

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## System Design

- Kick the Tires
- Get Demos
- Listen to Vendors
- Read Literature
- Visit Working Sites, Ask Questions
- Try a Pilot
- Buy a Scanner for Your Home PC

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## Incorporating Existing Equipment

- Can easily cost more than buying the new equipment.
- Find a way to move the old equipment down into the organization.

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## Asking Good Questions

- If you ask good questions, vendors will assign better people to your project.
  - Vendors will know they can't get away with less.
  - Successful projects are better than unsuccessful ones.
    - But vendors must plan for many unsuccessful projects.
  - Vendors are hungry for great reference sites.
    - Success requires support from great customers.

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# Document Management, Document Imaging

## Technical Relationships

- Calculate the crossover between optical and magnetic storage for your system. (yourself)
- Consider service bureaus for scanning your backfile (especially odd sizes like drawings).
- Distinguish between scanned paper images and imported computer files. (WP, CAD, etc.)
- Learn about electronic signatures, electronic seals, and encryption (my favorites).

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## Possible Integration Requests

- All hardware software, hardware, integration, and maintenance services must be bid as a single turn-key installation package.
- The system integrator must act as prime contractor and take full responsibility for all system components: hardware, software, and integration, during the system design, installation, and maintenance period.

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## What You Say is Not What They Hear

- A person, from outside the United States, was on vacation in the US. He was traveling on a very poor road. He saw a sign saying "End of Pavement". Assuming he was about to come upon the start of good pavement, he sped up.
- He should have known we speak differently, because in his brand of English it is illegal to drive on the pavements.

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## Assembly into a System

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## Network

- Windows 2000 has free networking.
- 100BaseT is coming down in price.
- Neatness counts in network and security configuration.
- Watch for bottlenecks.

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## Server (1)

- Compaq works better with Compaq components.
- Choose a PC designed to be a server
- Get a PC that is as fast as possible.
- Manage price as a percent of system cost.
- Calculate the crossover price point from optical to magnetic storage.

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# Document Management, Document Imaging

## Server (2)

- A 5 disk hardware RAID array is easier to understand than 30 disk software RAID.
- Plan to make 5 copies of all files on CD's or DVD's and send at least two copies out of country (state).
- CD's require a CD-R (A **CD Recorder**). There are also DVD-R's.

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## Client

- One step down from 'as fast as possible'. (decompression is in software)
- If necessary people can live with 17 or even 15 inch monitors.
- And with 80 or even 75 Hz refresh rates. (but not lower)
- Black and white can work, but color is more compatible with most GUI software features.
- Spend \$200, get a Gig disk.

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## System Design Considerations

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## Scaleability

- The scaleability of most document imaging systems is tied to the scaleability of Windows 2000.
- As Windows 2000 scales up and out, so do the document imaging systems.

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## Standards

- Allow document interchange
- Allow migration from your vendor
- Industry standards (defacto)
- Official standards (voluntary in USA)

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## Bottlenecks

- There is always a bottleneck just below the surface of calm system water.
- Removing a bottleneck always reveals the next bottleneck.

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## Safety Factors

- The smaller the system the larger the safety factor.
- Below the RFP limit, at least 100 percent, 250 percent is fine.
- A pilot will allow cutting the safety factor in half.
- Three years of operation will let the sharp pencil people in.

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## Stockpiling Equipment

- **Don't.**
- There is no component of document imaging equipment that does not have a high evaporation rate.

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## Uptime (/ Downtime)

- 98 Percent is reasonable for computer systems
  - (98 percent uptime is 3 hours downtime per week.)
  - If you included the words 'planned downtime.'
- Telephone COs (Central Offices) are planned to have one hour of downtime in 40 years.
  - This includes operator error.
  - On average, COs in the US are doing better than this.
- Frequently included under the general term 'good practices.'

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## Flip Rate

- We can see 60 pages per second
- Imagine looking for a word in a dictionary
  - You flip through 100 pages in 1 to 2 seconds
  - The art of book design makes this possible
  - Book design evolved to exploit our visual system
- Computer system designers think 1 page per second is good, 5 pages per second is overkill
  - This is why computer systems are not as fast as books.
  - And why computer system designers have so much paper at their desks.

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## When You Pick Up a Phone

- You expect dialtone.
  - You don't want a dialtone, you expect a dialtone.
  - You plan your life based on having a dialtone.
- Dialtone is slow after an earthquake.
  - We think the phone is broken.
- In some countries waiting for a dialtone is a full time job.

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## The Nines of Reliability

- One nine = 1 hour per day
- Two nines = 1 hour per week
- Three nines = 1 hour per six weeks
- Four nines = 1 hour per year
- Five nines = 1 hour per decade
- Six nines = 1 hour per century
- The CO (Central Office) goal is about 6 nines
  - The 6 thousand COs in the US are doing better than that.

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## The 1994 San Francisco Quake

- The telephones worked
  - The whole time
  - No reports of problems
  - All the COs ran on emergency generators for weeks.
- What happened after 24 hours?
  - The fuel tanks were empty, there was no power to pump diesel fuel, the diesel fuel distributors in the Bay Area were not interested in diesel fuel, just their families.
  - The phones worked.

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## Image Enabled Applications

- Linking document images with your existing databases
- Requires a degree of programming sophistication
- Will become the standard for all applications in the future
  - Until paper disappears

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## Retrieval / Indexing

- How Do You Do It Now?
  - Minimizes Training
  - Lowers Cost to Implement
- What Is the Most Needed New Capability?
  - What Would Pay for the System in a Month?
  - What Would Be Almost Free, But Have High Value?

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## Document Indexing

- In the Existing Database
- Input Indexing
- OCR
- Other

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## Making It Work

- William Mulholland ran out of money while building the Los Angeles Aqueduct.
- He only got to the north end of the San Fernando Valley.
- The bonds would go into default if the aqueduct did not reach the City of Los Angeles.
- By having the City of Los Angeles annex the San Fernando Valley, the aqueduct reached the City of Los Angeles with no further work.

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## Draw a Nice Picture

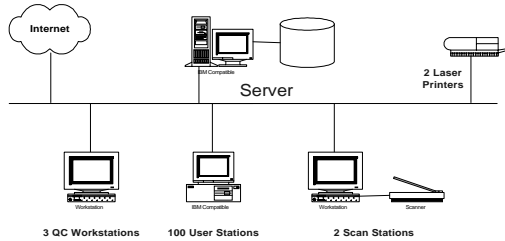
- Pizzazz sells.

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# Document Management, Document Imaging

## Network Diagram



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## Managing a Technical Project (For a Non-Technical Manager)

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## The Decisions are Yours

The Numbers  
Won't Select Your System  
for You

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## But . . .

- You Must Do Your Homework
  - Try Everything Yourself as Training
  - Offer to Help Others With Their Projects
  - Then Ask the Experts
  - Background Helps When Managing a Project

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## Your System Selection Will Be Based on Trust

- You Will Trust That:
  - You Selected the Right Criteria
  - You Estimated Correctly
  - Your Vendor Can Deliver
  - Your Vendor Will Deliver
  - Your Organization Will Support You Throughout Your Project

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## Question Everything

- Question People Who Agree with You
- Question People Who Disagree with You

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# Document Management, Document Imaging

## Question Everything

Then Make Decisions

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## Invest in Trust

- Find People You Like
- Build a Network of Support
  - And . . .
- Do Your Homework

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## What to Do?

- Make Friends
- Form a Network of Support
- Do Your Homework

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## The Environment

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## Microsoft

(And the Seven Dwarfs)

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## Environment: Why Microsoft?

- Microsoft, to some extent, defines the computer industry.
- Microsoft defines what is available technically to support system implementation.
- Microsoft watching provides input for future business plans and models.

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## Presentation Goals

- You will be able to describe Microsoft's direction.
- You will be able to plan for the future.

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## How to Evaluate an OS (Operating System)

- UNIX people evaluate OS's on technical merit.
- Accountants and Managers buy computers.
  - Does the software create a fungible staff?
  - Will the software last a long time?
- Only if desperate for an absolutely required (technically required) feature, will the UNIX person enter into the procurement process.

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## Me . . . ? Evaluate an OS?

- Wouldn't you just buy Windows?
  - Yes, most people would, and do.
- Microsoft is a Master of Paradigm Marketing
  - First Microsoft sold everyone on the idea (Paradigm) that Microsoft is the place to buy software.
  - Now, when most people look for an OS or Office Application, they only look at what Microsoft has.

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# What is Microsoft Up To?

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## 8 Billion Dollars (USD) in Profits per Year

(And USD \$3 Billion in R&D)

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## Microsoft

- US\$ 2 Billion per quarter profit
- Owns the foundation of the information economy
  - Won years ago
  - Is expanding in every direction
- Benefits the most from increases in the stability and structure of its own products
- Has what customers want most
  - Stability
  - Predictability
  - Ubiquity

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# Document Management, Document Imaging

## USD \$500 Billion Capitalization

(Microsoft is now the  
world's largest company)

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## How Can I Prove Windows [2000] Will Last 30 Years?

Because in 30 years,  
Bill Gates will be 75!

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### Limits on Microsoft

- Microsoft owns the foundation of the information economy.
  - Microsoft can move into a new area of its domain at any time.
  - Microsoft's two year old Expedia travel service does 16 million dollars (US) of business per week.
  - The information economy is said to be 70 to 90 percent of the world economy.
  - The world economy is about \$20 Trillion US.
  - Microsoft's share is about \$15 Trillion US.

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### Information Businesses

- Expedia.com (Travel Agency)
  - \$350 Million in ticket sales in under 2 years
- CarPoint (Car Sales)
  - 1.5 Million unique visitors in August 1998
- Sidewalk.com (Yellow Pages)
  - Delivers for 100 restaurants in New York City
- HomeAdvisor (MLS - Multiple Listing Service)
  - Integrates Loan Offerings

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### Religions and Orientations

- UNIX / SGML
- Documentum and Interleaf for republishing
- Adobe for Acrobat .PDF appearance
- Adobe for Postscript's mathematical precision

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## Unicode

The foundation for unified, single worldwide software releases.

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## Difference Between Microsoft and Linux

- Microsoft increases responsiveness based on purchasing power
- Linux increases responsiveness based on technical expertise and devotion to the concept of Linux

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## What Does Microsoft Have?

- Ubiquity
- The same thing that a marching army has:
  - Many small steps taken in unison are unstoppable.
  - A marching army must break step to avoid tearing apart suspension bridges.
- Microsoft unifies the industry.
  - Microsoft provides a stable development platform.
  - Microsoft delivers a huge, homogeneous market.
- Microsoft builds acceptable products, as needed.

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## Microsoft Initiatives

[And Press Releases]

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## New Microsoft Initiatives

- Merging the Application and Operating Spaces Via:
  - Object Oriented File System
  - Open Directory Services
- Clustering for Fault Tolerance (Failover)
- Clustering for Scaling Out (To Mainframe Size)
- Specifying PC 98 Hardware to Make PC's:
  - Friendly
  - Responsive
  - Forgiving
  - Entertaining

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## Existing Microsoft Initiatives (1)

- Windows 2000 Operating System
  - A Kernel Based Operating System
  - Preemptive, Multitasked, Multithreaded
  - Symmetric Multiprocessing (SMP) (Scale Up)
  - Networking
  - C2 Security
  - Unicode (Internationally Open)
- Windows 2000 Transaction Based File System
  - Rapid Recovery

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## Existing Microsoft Initiatives (2)

- Hardware Computability
  - Windows Hardware Quality Labs (WHQL)
- SQL Server (Structured Query Language)
  - Robust Database
  - Replication for Disaster Recovery (Remote Sites)
- Windows 95 / 98
  - Graphical User Interface (GUI)
  - Plug and Play
- Internet and Intranet

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## SQL Server 7.0

- Completely rewritten
- Microsoft moved 20 mission critical applications of its US\$ 14 billion business onto SQL Server 7.0 Beta (release) 3 in September 1998.
  - Including financials on SAP R/3
- Moving Microsoft.com website to SQL Server 7.0 (Structured Query Language)
  - 140 to 200 million hits per day

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## Windows 2000

- Also called W2K, the renamed Windows NT 5.0.
- Expected street date: Wednesday, October 6, 1999
  - Missing some of the consumer attributes
    - Office 98 Second Edition just introduced
  - Will eventually unify Windows 2000 and Windows 98.
    - Microsoft must unify W2K and W98 to save money.
    - having two operating systems (W2K and W98) is untenable.
  - W2K goes a long way to giving all Microsoft products model year names.
  - W2K has a very large number of very big changes.
    - Patches to Windows NT 4.0 can no longer support the changes required; W2K must now appear.

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## Merging Applications and the Operating System

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## Windows 98 Second Edition (W98E2)

- Solution to deliver personal PC features left out of Windows 2000 in the rush to complete W2K in October, 1999
  - Released June, 1999
  - More 'editions' of Windows 98 are planned
- Microsoft must eliminate Windows 98 in favor of Windows 2000 to unify its product line and put in place a robust industrial strength operating system.

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**B-94**

## Merging Windows 2001, SQL Server, and Exchange

- Microsoft plans to be the first company to take advantage of the freedoms afforded by its object oriented architecture.
- Steve Ballmer, President of Microsoft, speaking in Long Beach, California, Microsoft TechNet Briefing, (Microsoft event number 25316, <http://events.Microsoft.com>), on August 12, 1999, said:
- In the release (both Windows and applications) after the 2000 release this year, Microsoft planned to merge the Windows 2000 file system, the Microsoft SQL Server database, and Exchange (the equivalent of Outlook on servers).

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**B-95**

## Suites

- Microsoft made the idea of suites profitable.
- Microsoft Office is an application suite.
- Microsoft Back Office is an operating system suite.
  - Windows 2000 (formerly Windows NT) and SQL Server form the foundation.
  - Exchange manages mail, groups, and soon, all documents.
  - **I**nternet **I**nformation **S**erver (IIS) manages the Internet.
  - **S**ystem **M**anagement **S**ervices (SMS) manages hardware, software, and licenses (a major interest).
  - SNA Server manages interfaces to IBM.

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**B-96**

# Document Management, Document Imaging

## Office 2000

- Released to manufacturing March 29, 1999
- Released to the public on Thursday, June 10, 1999
  - Office 98 only appeared on the Mac, PCs only have Office 97
- All files stored in XML (eXtensible Markup Language)
  - New version of HTML (HyperText Markup Language)
  - With Microsoft extensions (see Internet Explorer)
- All files stored in Unicode
  - Not ASCII (American Standard Code for Information Interchange)
- New FrontPage
- New Outlook / Exchange
  - Can store any document (as an email attachment)
  - Outlook can substitute for Exchange.
  - Microsoft's universal document management solution (to be)
  - Exchange due 90 days after Windows 2000.

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## Object Oriented File System (OOFS) (1)

- Morphed into Active Directory
- Was part of Cairo. (Windows NT's successor)
  - Cairo was folded into Windows NT.
  - Windows NT is now Windows 2000.
- In document management, pages are stored as separate files.
- With Active Directory the file system knows the pages are part of a document.

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## Object Oriented File System (OOFS) (2)

- In spreadsheets, cells can be managed as objects.
- In word processors, characters, words, sentences, paragraphs, and sections can be managed as objects.
- In databases, fields and records (rows) can be managed as objects.

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## Microsoft Active Directory

- MS Active Directory is used for Windows 2000 security and file access.
- MS Active Directory is open to any database application.
- MS Active Directory merges phone, email, and groupware directories, organization charts, mailing lists, and the entire Internet with Windows 2000 directory services, security, and file access.

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## Microsoft DFS: (Distributed File System)

- Files look like they are in your directory.
- Files can be anywhere on the Internet.
- Files can be replicated transparently at any number of sites, anywhere on the Internet.

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## Merging Applications and the Operating System

- With an Object Oriented File System, the finest level of detail, the smallest elements of applications, can be stored and retrieved by the file system of the operating system.
- With Open Directory Services, the metadata of an organization (names, addresses, and organization charts) are merged into the file and security system of the operating system.

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# Document Management, Document Imaging

## Groupware

- Software to support collaboration
- Now means Microsoft Exchange
  - Currently is a mail program
  - Microsoft announced groupware components in Sept. 1998
  - All files are full text indexed as part of the file system
  - Will expand to all documents
  - Microsoft Word stores raster images now
  - The active directory file system of Windows 2000 in 1999 will provide document structure as part of the file system
  - Microsoft recommends that organizations maintain their organization charts and telephone books in Exchange

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## Microsoft in Court

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## W2K and O2K Adoption Scenario

- The great toilet paper panic of 1972
- Or — will my PC blow up and burn down my house (office) at midnight, December 31, 1999.

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## Legal Issues (1)

- In the consent decree Microsoft agreed to change its DOS (Disk Operating System) marketing practices.
  - This was two weeks before DOS was discontinued in favor of W95 (Windows 95)
  - Microsoft wrote into the DOS consent decree that they could combine W95 and IE (Internet Explorer).
- The Government now wants Microsoft to change its W98 (Windows 98) marketing practices.
  - Windows 98 is the last version of the product.
  - It is the end of the product line.

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## Legal Issues (2)

- The government is seeking to create two products (W98 and IE 4.0, now IE 5.0) where there is one (W98).
  - Microsoft is planning to decompose all its products (Operating Systems and Applications) into hundreds of thousands of programmable objects to make all its products fully scriptable (all mouse clicks and keystrokes can be simulated with a program).
  - Thousands of resellers will roll their own versions of operating systems and applications from these programmable objects. This cacophony will drive out competing, non-Microsoft based products.

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## Scaleability

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# Document Management, Document Imaging

## Scaleable Computer Systems

- Scaleable computer systems can grow an application's client base, data base, and throughput without application re-programming.
  - The scaled-up server should be as easy to manage as a smaller system – at least on a per-user basis.

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## Scaling: To Handle Bigger Jobs

- Scaling Up
  - Bigger Iron (PC's)
  - Multiprocessing
- Scaling Out
  - More (Less Expensive) PC's
  - Clustering

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**Microsoft:** “SQL Server achieves scaleability today by supporting Symmetric Multiprocessing (SMP). Beyond that, Microsoft SQL Server will scale out by partitioning a huge database into a cluster of servers, each storing part of the whole database, and each doing a part of the work.”

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# Clusters

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## Clusters of Commodity Components are Economical

- Clusters can be built with high-volume components which are relatively inexpensive.
- Inexpensive clusters can be built with commodity four-way SMP hardware systems.
- Because they are built from commodity components, commodity clusters can grow in smaller increments.
- You can add disks or nodes or network cards as needed rather than having to buy a huge new box each time you grow.

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# Reliability

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# Document Management, Document Imaging

## Failover Clustering in SQL Server

- Microsoft SQL Server 7.0, in cooperation with various hardware vendors, supports high-availability databases via cluster based fail-over from one node to another.
- Active-X Transactions allow Microsoft SQL Server databases to be partitioned among multiple Windows 2000 Servers.
- The Microsoft SQL Enterprise Manager allows an operator to monitor and manage multiple SQL Servers from a single console.

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## Continuous Availability

- The cost of downtime increases with system size.
- Paradoxically, larger systems have more components and so are more likely to break.
- Scaleable systems must deliver continuous 7 x 24 availability (7 days x 24 hours per day).
  - They must allow online operations (backup, recovery, reorganization, upgrades).
  - Must mask hardware and software failures with automatic fail-over to another server.

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# Big

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**Microsoft:** “Windows 2000 Server and Microsoft SQL Server scale up to huge databases on a single SMP and scale out to multiple servers each executing a part of the application and storing a partition of the database. SQL Enterprise manager makes it easy to configure and manage these servers. Active-X Transactions, replication and data pipes make it easy to move data and requests among them.”

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**Microsoft:** “Our goal for 1998 is to support 200,000 users on a 16 node Windows NT Server cluster where each node is a 4-way multiprocessor with one hundred discs (800 GigaBytes). This is potentially a 10 TeraByte database [200 million pages]. Such a system should be big enough for most application problems. If current price trends continue, in 1998 such a cluster could be built from commodity components for about a million dollars.”

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## Dell 3 TeraByte Server

- At Sept. 1998 Comdex Enterprise conference in San Francisco
- 3-terabyte data warehouse
- IBM DB2 Universal Database Extended Enterprise
- Running on 16 four-processor Dell PowerEdge 6300 servers
- Using the new Virtual Interconnect Architecture specification
  - Intel-based vendors co-developed as a standard
  - To scale their systems beyond two- or four-node NT parallel database clusters.

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# Document Management, Document Imaging

## Novell (1)

- Started to help Microsoft sell into networking opportunities
  - When Novell makes a sale, it increases Microsoft's overall market size and sells more Windows products
- Created a large market base for Microsoft networking products
  - When Microsoft sells networking it increases Microsoft's revenue
- Microsoft Networking is free with W2K

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## Novell (2)

- It is currently more profitable for Windows 2000 to be compatible with Novell
  - Compatibility was announced in making it so
    - and then followed by implementation efforts by users and other vendors
- Eventually it may be more profitable for W2K to not be compatible with Novell
  - Incompatibility can be announced to make it so
- The newest version of Lotus Notes does not support Novell

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# Friendly

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## PC Advances to Provide an "Appliance" Experience

- Extremely simple operation (Appliance-ness)
- Anyone can do the top 10 tasks immediately with no prior experience with device; tasks include:
  - Playing a game
  - Watching a movie
  - Writing an e-mail, letter, or invitation
  - Browsing the Internet
  - Hooking up another device
  - Listening to voice messages

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# Responsive

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**Microsoft:** "For the PC to become a more integral part of daily life in the office and the home, the PC must be instantly available to answer the phone, display new e-mail, or browse the Internet. As with appliances, the PC must always be on and ready for use but appear to be off when not in use. The PC hardware and software must be capable of responding immediately to the On button, network or communication events, and other actions. Finally, the PC must be capable of returning to its "off but ready" state automatically."

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# Document Management, Document Imaging

## Forgiving

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**Microsoft:** “Device bay devices must be able to survive harsh environments. Examples of harsh environments include being carried inside a soft-sided briefcase, device insertion by a toddler, or user attempts to insert devices in the wrong orientation with considerable force.”

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## Entertaining

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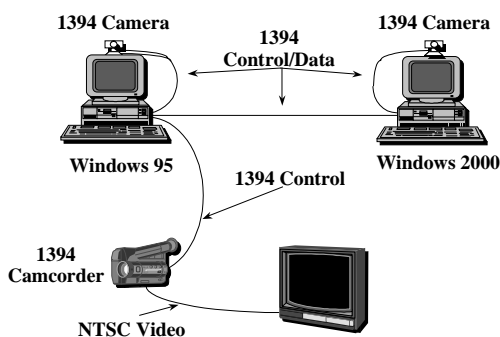
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**Microsoft:** “Entertainment PC 97 is an interactive multimedia system optimized for games, education, personal communications, and TV viewing. Key features that differentiate the Entertainment PC 97 from other system types include 3-D graphics and audio, MPEG-II support, high-performance video [DVD], high-fidelity audio, and connections to consumer electronics devices such as home stereos, telephones, VCRs, camcorders, digital satellite systems, and so on.”

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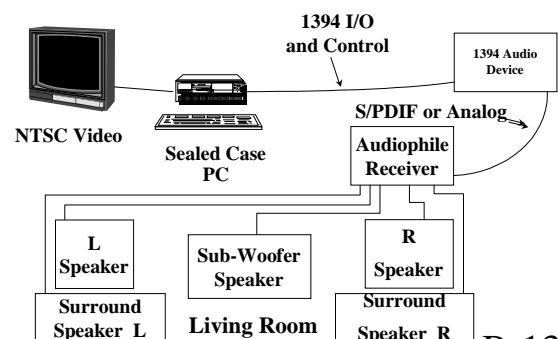
### IEEE 1394 Video



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### PC in the Living Room



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# Document Management, Document Imaging

## Big Change

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## SIPC Framework (Simply Interactive PC)

Multimedia and Entertainment	“Appliance” Experience	Internet and Communications
<ul style="list-style-type: none"><li>◆ Direct3D</li><li>◆ DirectMPEG</li><li>◆ DirectSound</li><li>◆ ActiveMovie streaming</li><li>◆ Multimonitor Support</li><li>◆ Low-latency Services</li><li>◆ Win32 Driver Model (WDM)</li><li>◆ Higher-Quality Audio</li><li>◆ MMX Support</li></ul>	<ul style="list-style-type: none"><li>◆ OnNow</li><li>◆ Device Bay</li><li>◆ USB</li><li>◆ IEEE 1394</li><li>◆ Consumer Electronics UI</li><li>◆ PC Card</li><li>◆ Plug and Play Enhancements</li><li>◆ Software Control Set for Hardware Devices</li></ul>	<ul style="list-style-type: none"><li>◆ Internet Explorer 3.0</li><li>◆ ActiveVRML</li><li>◆ ActiveScripting</li><li>◆ ActiveX Controls</li><li>◆ ActiveMovie Streaming</li><li>◆ Active Conferencing</li><li>◆ Unimodem/V</li><li>◆ GetISDN</li><li>◆ Personal Web Server</li><li>◆ RSACI Ratings</li><li>◆ Web View Integrated into Windows Shell</li></ul>

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## End Microsoft (Letting Go of Tar Baby)

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## Records Management

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## Records Management

- Views the Recorded Activity of the Corporation as a Whole
- Assesses All Constituencies’ Needs and Requirement for the Records
- Reviews Records for Security, Integrity, and Accessibility

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## Records Management Time Frame

- Records Managers Must Accommodate Changes in Technology from the Time a Record is Created Until the Record is Destroyed

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# Document Management, Document Imaging

**CD ROM's Are 15 Years Old**

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**The Internet is 30 Years Old**

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**The Third Millennium Started in**

**1994**

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**Stephen the Short Was Off by 6 Years When He Established the Calendar for the Catholic Church.**

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**We Base A Lot  
on the Records We Keep**

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## **History of Records Management (1)**

- Dr. Nathaniel S. Rousenau invented vertical filing (File Cabinets).
- First General Records Disposal Act passed by US Congress in 1889
- US Bureau of Efficiency Established 1912.
- US National Archives Founded 1934.
- First Records Disposition Schedule by the US National Archives in 1943

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# Document Management, Document Imaging

## History of Records Management (2)

- ARMA International (Association of Records Managers and Administrators) founded in 1956 as the American Records Management Association.
- ICRM (Institute of Certified Records Managers) founded in 1975. (Administers the CRM exam.)

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## Metadata

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## And the Score Is . . .

# 5 to 4

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## Where Is the Metadata?

- The names of the blank boxes on a form
  - Is the name 'Clark Thomas' or 'Thomas Clark'?
- The data dictionary for a database
- Field names on a tape record
- The division name on the storage boxes
  - Which division's accounting records are they?

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## Accessibility

- Metadata
- Labeled Boxes
- Devices to Read the Media
- OS Version to Support the Application Version
- Document Images on the Internet

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## Preserving Metadata?

- Most metadata is in ASCII.
  - (American Standard Code for Information Interchange)
- Microsoft W2K (Windows 2000) is moving from ASCII to Unicode.
- XML (eXtensible Markup Language) is the language for document metadata.
- Microsoft is moving from HTML (*H*yper*T*ext *M*arkup *L*anguage) to XML which is a more complete subset of SGML (*S*tructured *G*eneralized *M*arkup *L*anguage).

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# Document Management, Document Imaging

## Provenance

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## Provenance

- An archival term meaning the history of an object or document
- More prosaically (in working terms), in document imaging, it means:
  - Where were the staples before you prepped the documents for feeding through the scanner
  - Which folder was the document in, etc.

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## Retention Schedule

- Backup Plans Guarantee Data Integrity
- Retention Schedules Manage the Creation, Storage, and Destruction of Records
- Records Management and MIS Can Work Together to Integrate the Two Plans and Goals

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## Manuals

- SGML or Die
- And Other Metadata Incantations
- ‘Religious’ Issues & Corporate Issues
- Electronic Signatures
- The Benefits of Fixed, Infrequent Publication Dates

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## Updating Public Record Ordinances to Support Hyperlinked Objects on the Internet

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## Public Record Ordinances

- Are Essential to Our Society and Our Freedom
- Require Submission on Paper
  - Discard Most Object Oriented Rules and Links
  - Disconnects Internet Document Hyperlinks
  - Erase the Fruits of Our Use of Technology
- Need To Be Updated
  - While Maintaining Their Goals In Support of Our Society
- [Spatial Indexing of Records]
  - Make all those hours with a joystick the right thing to do.
  - Bringing the mountain Mohammed.

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# Document Management, Document Imaging

## On Organizing Documents

- Document Imaging does not magically organize unorganized records.
- Records should be organized before they are entered into a document imaging system.
- It is not wise to add records management problems to the imaging system implementation effort.

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## Records Management Program

- Records Inventory
- Records Retention Schedule
  - All Types of Records
  - Origin
  - Physical Class
  - Function
  - Organizational Relationship
  - Applicable Regulations

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## Lifecycles

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## Forms Lifecycles

- Form Lifecycle
- Form Instance Lifecycle

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## Records Life Cycle

- Creation
- Distribution and Immediate Use
- Storage and Maintenance
- Retention
- Disposition
- Archival Preservation

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## Inactive Records

- Bankers Boxes (Records Cartons)
- Shelving
- Barcoding, Scan on Demand
- Inhouse
- Commercial Records Centers
  - 10 to 25 cents per month per box
  - 2 to 5 dollar retrieval fee per box

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# Document Management, Document Imaging

## Archives Management

- Appraisal
  - Review all Records
- Accessioning
  - File Archived Records in Archives
  - Prepare, Adapt Finding Aids for Use
- Protect and Preserve Forever

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## Why Have Records Management? (1)

- Regulatory Compliance
- Business Operation
- Cost Containment
- Monitor New Technology
- Minimize Litigation Risk
- Safeguard Vital Information

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## Why Have Records Management? (2)

- Safeguard Vital Information
- Control the Creation of Records
- Support Management Decisions and Planning
- Preserve the Corporate Memory
- Foster Professionalism in Business

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## Records Management Barriers

- Records Management does not generate income.
- Records Management is not the organization's primary business.
- Most Records Management tasks are discretionary.

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## Tasks Related to Records Management

- Forms Management
- Mail / Message Management / Internet Management
- Reprographics / Demand Printing / Report Distribution / COOL

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## ISO 9000

- Quality Standard
- Uses Records to Support Quality Management
- Requires Explicit Procedures for Records and Information Management
- Manages Organization Wide Quality Including Sales and Marketing

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# Document Management, Document Imaging

**Do You Want to Be an  
ISO 9000 Library?**

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**Do You Want to Be an  
ISO 9000 University?**

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**Do You Want to Be an  
ISO 9000 Archive?**

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**Do You Want to Be an  
ISO 9000 Manufacturer?**

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**Do You Want to Be an  
ISO 9000 Records Center?**

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**Do You Want to Be an  
ISO 9000 Organization?**

**(Library, Archives, Museum, Records Center)  
(Manufacturer, City, University, Law Firm)**

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# Document Management, Document Imaging

## Document Imaging and Document Management for Litigation Support

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## Document Processing

- Discovery, Production
- Scan, Identify, OCR, Store
- Code, Index, Workflow
- Import, Load, Merge, Link
- Display, Print, Transmit
- Search, Tag, Collaborate, Prepare Case
- In-Court Presentation
- Warehouse/Archive (To serve client interest)
- System Design, Sources of Information

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## Discovery/ Production

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## Discovery / Production

- Discovery is the process of obtaining access to a copy of the opponent's files for the purpose of searching through them.
- Production is the process of responding to a discovery request by providing your organization's opponent access to your organization's files.

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## Informal Formality

- Email and Voice Mail
- All Corporate Records are Discoverable (in US)
- Windows 2000 Supports Exchange for Email
- Windows 2000 Has Extensive Support for Voice Mail
- Informal Statements End Up In Permanent System Backups - the 'Keep Forever's'

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## Scan

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# Document Management, Document Imaging

## Document Identification

- Done by scanner operator
- Not the same as document indexing
- Minimum information necessary to link paper document with digital document images
- Also done by Bates numbers
  - Bates stamp marks each page with a sequential number and automatically advances for next page
  - Pages can be marked before or after scanning

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# Code

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## Code

- Letter Example for Coding:
  - From (Author)
  - To (Recipient)
  - cc (Carbon Copy)
  - Date
  - Subject
  - Document Type
  - Other fields as requested
  - Keywords
  - Bates number
    - Start and ending number for multipage document

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# In-Court Presentation

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## In-Court Presentation

- Three parts of vision
  - Resolution, detail (black and white)
  - Color
  - Motion
  - The foundation of optical tricks (illusions)
- Big, bright, high resolution
- Medium can carry the same weight as the presentation content

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# Warehouse/ Archive

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# Document Management, Document Imaging

## Warehouse/Archive

- Law firms keep client records as long as they serve the client's interests.
- This frequently results in permanent retention.
- Most firms retain both the document image and the paper that was scanned.
  - Eliminating the paper would greatly reduce storage costs and would not require any additional scanning, coding, or indexing because the coded and indexed digital copy already exists.

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## Litigation Support

- We Do Not Have Any Records That Show That
- We have Analyzed the Documents You Provided Under Our Discovery Proceedings
- Here is a Record of All of the Documents We Have in Storage
- We Destroyed Those Documents According to this Retention Schedule

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## Operating a Commercial Records Center

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## Commercial Records Centers

- Contract off-site records storage
  - In records storage cartons
    - standard records storage carton (box) is about 12 inches wide by 15 inches long by 9 1/2 inches deep (300 mm x 375 mm x 235 mm)
  - Warehouses with 18 to 55 foot ceilings
    - New standard from the US National Archives
      - 36 CFR (Code of Federal Regulations) Part 1228
      - Proposed rule published in the Federal Register on April 30, 1999, in Part VII at page 23,504

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## Commercial Records Centers

- About 400 in United States
  - Average about 1 million boxes per company
  - Many small companies
  - A few large national / international chains
- Beginning to appear outside the United States in greater numbers
  - The first were in Canada and Europe
  - PRISM International (**P**rofessional **R**ecords and **I**nformation **S**ervices **M**anagement International)
    - Formerly ACRC (Association of Commercial Records Centers)

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## Scanning Today and in the Future

- What should a Commercial Records Center Do?
  - Scanning is less expensive than delivery.
  - Scanning is more expensive than storage.
- Future Technology (in Commercial Records Centers)
  - What will happen before you pay off your mortgage? (20 years)
  - Or sell your building? (5 years)

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# Document Management, Document Imaging

## How Many Pages Will You Scan in the First Year?

- 40 deliveries per day (replaced by scanning)
- 100 pages per delivery (desired folder contents)
  - Customers often order a box to get a folder
- 50 deliveries X 100 pages = 4 thousand pages / day
- 250 days X 4 thousand pages = 1 million pages / yr.

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## Converting Boxes to GigaBytes

- ‘~’ means ‘about’, ‘approximately’
- Quick Rule: 4 boxes ~ 1 CD-R ~ 1/2 GigaByte
  - CD-R (Recordable CD)
- 8 boxes ~ 1 GigaByte (1,000 MegaBytes)
- 8 thousand boxes ~ 1 TeraBytes (1,000 GigaBytes)
- 1 box ~ 2,500 pages (single sided assumed)
- Double sided pages require twice as much storage per box.
- These numbers will get you started, you can measure the actual storage used for more precision.

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**B-194**

## Digitize Everything: The Story (1)

- Blank CD-R (Compact Disc - Recordable)
  - US\$ 1 to US\$ 2
    - Guaranteed for 100 years
  - 1/2 GigaByte (4 Boxes) 25 to 50 US-cents per box
- Blank DVD-R (commonly Digital Video Disc - R)
  - Ditto (in a year or two) (US\$ 1 to US\$ 2, 100 year guarantee)
  - 4.5 GigaBytes (36 boxes) 3 to 5 US-cents per box

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**B-195**

## Digitize Everything: The Story (2)

- Cost of on-line digital magnetic storage:
  - Declining at 40 percent per year
  - 8 boxes per GigaByte (1,000 MegaBytes)
    - US\$ 20 to US\$ 200 per GigaByte to purchase
    - US\$ 2.50 to US\$ 25 per box for permanent storage
    - 1,000,000 hours MTBF (*Mean Time Between Failure*)  
5 US-cents per page minimum
- The cost of scanning:
  - Changes very slowly.
  - 2,500 pages per box
    - US\$ 125 per box for scanning

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**B-196**

## Cost of Scanning

- 5 cents per page minimum (absolute minimum)
  - The cost of scanning changes slowly
  - 2,500 pages per box
  - \$125 per box for scanning
    - \$125 thousand for 1 thousand boxes
    - \$1.25 million for 10 thousand boxes
    - \$12.5 million for 100 thousand boxes
    - \$125 million for 1 million boxes

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**B-197**

## Cost of Storing a Box

- 15 to 25 US cents per month
  - US \$1.80 to US \$ 3.00 per box per year
  - US \$ 18.00 to US \$30.00 to set up an annuity for perpetual storage; to store one box forever
- vs. \$125 per box for scanning
  - For an additional 20 percent, all scanned materials can be stored forever in paper form as well as in digital form.

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**B-198**

# Document Management, Document Imaging

## Cost of Scanning

- Scanning service bureaus will always scan for less than commercial records centers.
  - Scanning service bureaus: 5 cents per page
  - Commercial records centers: 20 cents per page
- It will always cost more to store boxes in scanning service bureaus.
- Commercial records centers have the records, and the customers want them delivered immediately.

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**B-199**

## The Desire to Scan Everything

- It is too expensive (not cost effective)
- If the customer really wants every page in a box, consider physically delivering the box.
- Some well funded customers may still want scanning
  - You may lose these customers if you can't offer scanning
  - Keeps scanner busy
  - Steady cash flow

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**B-200**

## Scanning and Customer Retention

- Customers may not be ready for scanning for years, but they want to be sure their commercial records center has it now.
- Scanning rounds out brochures and customer presentations.
- Customers will use their commercial records center's scanning services (and scanning materials) to show they (the customers) are planning for the future.
- Do not start with difficult customers.
- Applies to getting new customers too.

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**B-201**

## Is it Legal?

- Yes, it is analogous to microfilming.
- Anything can be done wrong.
- Records storage centers are a link in the physical chain of custody of records.
  - The chain can be broken through errors.
- Clever lawyers can create doubt in any situation.
  - Scanning is no different than any other business activity.

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**B-202**

## Business Issues in Scanning

- Start small, fail small.
  - Experience comes from computer system replacements.
- Get it working before your customers see it.
- Learn as much as you can about it.
- Learn as much as you can about operating it.
  - Your competitor used to own a computer store.
- Finish projects early and often so you can apply what you learned early and often.
- Get behind your system and ***make*** it successful.

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**B-203**

## Pages to MegaBytes (& GigaBytes)

- '~' means 'about', 'approximately'
- 8 1/2 by 11 inches is 93 1/2 square inches (~100 sq. in.)
- 300 dpi x 300 dpi = 90 thousand dots per square inch
- 100 square inches X 90 thousand dots ~ = 9 million dots
- 9 million 1 bit (black or white) dots ~ = 1 MegaByte / Page
- With ~20 to 1 compression: 1 MegaByte ~ = 50 KiloBytes
- 20 times 1 page (50 KiloBytes) ~ = 1 MegaByte
- 20 thousand pages ~ = 1 GigaByte (1,000 MegaBytes)

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**B-204**

# Document Management, Document Imaging

## Cost of Storage vs Cost of Scanning

- '~' means 'about', 'approximately'
- Cost to scan 1 box at 5 cents per page: \$125
- Cost to store 1 box in digital form:
  - \$40 per GigaByte in 1999
  - 8 Boxes per GigaBytes ==> \$5 per box to store digitally
- Cost of digital storage drops at 40 percent per year
  - And it already does not matter in 1999
  - Magnetic disk drives are advertised to have a 1,000,000 hours MTBF (Mean Time Between Failure)

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**B-205**

## Scan on Demand

- Competes with the cost of physical delivery
- Requires a computer system
  - Track scanned images
  - Provide security and passwords
  - Integration with records management system
- Must be managed
  - Or — it is just a fax system

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**B-206**

## Indexing

- Box in warehouse
- Folder in box
- document in folder
- Name of document
- Document labels: date, number, client name, etc.
  - Full text will help avoid indexing
  - Client may do detailed indexing

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**B-207**

## Fax Only

- If you have two databases of the same client information, the information for a given client will be different in the two databases.
- Scanning twice produces two copies.
  - The two copies will be different.
  - The two copies will be compared by the customer.
- Careful management of data reduces problems.

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**B-208**

## 1 Scan System = 1 Truck

- The two cost about the same to own and operate.
- Like trucks, you may want two complete systems.
- You will need a systems person you can work with and trust.
- The only way to understand backing up a system is to lose data.
  - Most records centers use computers to track boxes and have lost data.

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**B-209**

## Internet Delivery as an Email Attachment

- Modem (56 Kbits/s) : 3 pages per minute
  - (1 box per day)
- ISDN (128Kbits/s) : 10 pages per minute
  - 1 box in 1/2 day
- Cable (TV) Modem (500 Kbits/s): 1 page per second
  - 1 box per hour
- DSL (*D*igital *S*ubscriber *L*ine) (8 Mbits/s): 20 pages/s
  - 1 box in 2 minutes
  - Ranges from 1/2 to 8 Mbits per second depending on location.

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**B-210**

# Document Management, Document Imaging

## What Does the User Do With It

- Keep the scanned document as an email attachment.
- Add the document to a document management system.
  - Manually
  - Automatically
- Depend on you to find it for them when they need it again.

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**B-211**

## Managing Imaging

- Not watching your imaging project closely is like leaving the wrong person in charge when you go to a conference or class.

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**B-212**

# RFP

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**B-213**

## RFP

- RFP (**R**equest **f**or **P**roposal)
- RFI (**R**equest **f**or **I**nformation)
- Assorted Other Acronyms

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**B-214**

## The Politics of an RFP from Authorship to System Operation

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**B-215**

# The People Side

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**B-216**

# Document Management, Document Imaging

## What is the Magic Elixir, the Silver Bullet, the Secret Solution?

### People

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B-217

## The Contexts of an RFP

- Many different considerations affect an RFP.
- Each consideration lives in a world of its own.
  - And one world does not want to be concerned with another world.
- Writing an RFP is bringing harmony to these worlds.
  - Even if an RFP is not necessary, this is a good reason to write one.

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## Context of an RFP

- People
- Technology
- Rush, Pressure
- City
- Time
- Politics
- Vendors
- Cost
- Other Cities
- State
- Federal
- Laws
- Knowledge Base
- Existing Computer Systems
- Existing Imaging Systems
- Interesting, But Not Burning Desire

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B-219

## Personal RFP Contexts

- Everyone in this room has a context for an RFP.
  - Each person's context for an RFP is make up of a smidgen of each of the contexts listed.
- Everyone's context for an RFP is different.
  - Just as everyone's context for their organization is different.

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## Talk the Talk, Walk the Walk

- Use the terminology well.
  - e.g. *Internet* or *Intranet*, as appropriate.
  - Put the right spin on your computer terms.
- Have many eyes check what you wrote.
  - Not just for legal and technical accuracy, but also for usage and style.
- Do everything well.
  - It has its own rewards.

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B-221

## Logic

- Use logic to persuade:
  - It is logical to say "It is not logical to be logical."
- If logic doesn't work, use something else.
  - Fun, for example.
- Remember, document imaging creates digital analogs of the pages which we transmit over analog digital communications lines and make analog digital recordings of.
  - Not many Computer Scientists have contemplated digital analogs or analog digital signals.

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# Document Management, Document Imaging

## Silly, a Word in UNIX-Speak

- It describes a metaphor that pokes fun at being over-awed by the importance of system design.
- Translated to records management-speak, an example would be:
  - “Destroy these records, but make a file copy first.”

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**B-223**

## Think the Unthinkable

- Could you cover it up?
  - Smaller is easier to cover up.
  - Have you made plans?
- Will everyone support you?
- How could you make the best of it?

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**B-224**

## Vendors

- Vendor Considerations
  - Good Source of Information
  - Respect Their Profession
  - They Are On Your Team
  - It is Your Job to Provide Balance
    - It is Their Job to Sell (Use Their Selling Skills)

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**B-225**

## Advice to Vendors

- Don't Respond to an RFP Unless You Have Talked With the Person Who Wrote It.

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**B-226**

## Should You Start with a Stock RFP?

- Yes, look at several.
- No, you must start from scratch, even if it looks a lot like one or more stock RFP's.
  - It must be your own work.
  - It is a lot safer that way.
- Some RFP's are very elaborate.
  - Write one that is appropriate to your organization.

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**B-227**

## Sections of an RFP (1)

- Cover, Use Color
- Greetings Letter, Thank the Vendors for Taking the Time
- Organization Background, History
- Application, Today, in the Future
- Implementation Sequence

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**B-228**

# Document Management, Document Imaging

## Sections of an RFP (2)

- Budget Amount
- Payment Schedule
- Proposal Format
  - Suggested
  - Required
  - . . . and a Floppy
- Evaluation Criteria

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**B-229**

## Sections of an RFP (3)

- Records Survey, Inventory
- Maintenance Costs
- Upgrade Costs and Path
- Training
- Existing Systems
- Vendor Background
- Insurance
- Legal

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**B-230**

## RFP Response

- Let them know what you expect.
- Let them know who the contact(s) is.
- You can avoid fax responses.
- Let them put in brochures.
- Don't overdo the number of copies.

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**B-231**

## Schedule of Events (RFP)

- Do you want a bidder's conference?
- Do you want a walk through of your site?
- Do you want demonstrations?
- Will you send out RFP changes? How? When?
- When do you want the responses?
- How will you extend the response deadline?

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**B-232**

## Schedule of Events (System)

- What schedule will the system be installed, tested, accepted, turned over on?
- What is the payment schedule?
- What sort of project management will be used to track the project?
- When will you have meetings on the project?
  - Monthly?

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**B-233**

## Vendor Background

- References
  - Customers
  - Trade
  - Financial
- History
- Resumes
  - Who will actually work on the project

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**B-234**

# Document Management, Document Imaging

## Legal

- Be sure legal signs off on it.
- Be sure you know what vendors think of it.
- Be sure that it controls vendors.
- Be sure that it does not control you.

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**B-235**

## Legal Details (1)

- Specify a firm, fixed price.
- Make the proposal part of the contract.
- Use prior to acceptance does not constitute acceptance.
- Reserve the right to purchase the system, or any parts of the system, from any source.

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**B-236**

## Legal Details (2)

- Require a prime contractor.
  - A single point of responsibility.
- Right to reject any and all proposals.
  - Right to reject any or all parts of any proposal.
- Unavailability of funds:
  - If funds are unavailable, reserve the right to postpone or cancel the award.
  - Reserve the right for convenience.

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**B-237**

## Legal Details (3)

- Specify how to take exception to the RFP.
- Specify a method of withdrawing proposals.
- Specify rights to pertinent material.
  - All materials become the property of the city.
  - Confidentiality of documents.
  - Non-disclosure.

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**B-238**

## Legal Details (4)

- Cost of proposal not paid by the city.
  - Consider funding a study.
- Specify how you will modify the RFP.
- Restrictions on contact with city employees.
- Other general conditions.
  - See your legal department.
  - Make sure they sign on.
- For each detail, vendors have a response.

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**B-239**

## System Components

- Available Off-the-Shelf
- Of Current Manufacture
- In Regular Production
- New (not used)
- Not Beta
- Not A Prototype
- Not a Special
- Guaranteed Support in All Future Releases

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**B-240**

# Document Management, Document Imaging

## Features & Benefits

- Request that vendor responses categorize each listed feature as:
  - Available in Base System
  - Can Be Added at No Cost
  - An Extra Cost Item
  - Not Available
  - Negotiable
  - Other

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**B-241**

## Response Time

- A second or two for images
  - More for jukeboxes (autochangers)
- Milliseconds for database inquiries
- Under what type of system load
- Allow yourself a way to relax the requirement.
- Prevent vendors from unilaterally relaxing the requirement.

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**B-242**

## Source Code

- What if the software vendor disappears?
- For big vendors, the users band together.
- For small vendors, software can be put in escrow.
- You will eventually have to export your documents to the system of a surviving vendor.

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**B-243**

## Theft

- Due diligence
  - References
  - Contacts
  - Years of familiarity with industry players
- Some legal protection (words)
- You must know the people you are dealing with.

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**B-244**

## Records Survey

- Based on your records management system.
- Include yearly growth.
- Provide schedule for backfile conversion to document imaging.
- Include document size, binding, and quality.
- You should consider including some or all electronic records.

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**B-245**

## RFP Sizes

- Big
  - Cost as much as a small imaging system
- Small
  - Less Risk
  - Less controls required

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**B-246**

# Document Management, Document Imaging

## Checks and Balances

- Big RFP:
  - Can be written by a consulting firm.
  - You could use a small outside party to watch the two big outside parties.
    - the RFP consulting firm
    - the system vendor
- Small RFP:
  - You could use a small outside party to check on one not-as-big outside party. (The system vendor.)

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**B-247**

## RFP's for Thespians

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**B-248**

## First, Someone Gets a Bee in Their Bonnet

- Hopefully they immediately come to you.
- Soon there is a committee.
- A camel is a horse designed by a committee.

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**B-249**

## The first Reason for an RFP Is to Let the Vendors Do All the Work

- Throw in whatever anyone can think of, ask all your questions with a 'must' or 'will'.
- Vendors want some return on their effort.
- No one is sure if they really want a system.
- Sometimes something is actually purchased, usually providing tar and feathers for all involved.

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**B-250**

## Under Ideal Circumstances, You Do Your Homework

- You design a system that meets your needs.
- Most components in your design are from specific vendors.
- You could live with other vendors for some of the components.
- You have your design tested by experts.

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**B-251**

## You Write an RFP for the System

- Not everyone gets on board with you, the strays are plotting your demise.
- You did not make sure that legal said everything they wanted to.
- The vendors that responded to last year's RFP are angry that you do not favor them.
- Disgruntled vendors and last year's system champions are working with the people on the sidelines to delay, suspend, supersede, or terminate your RFP.

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**B-252**

# Document Management, Document Imaging

## Changes (1)

- You did not talk legal out of requiring something that your preferred vendor can not do.
- You did not realize that some of the component specifications had subtle meanings, knocking out your preferred vendors.

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**B-253**

## Changes (2)

- The purchasing department added a few specifications from a vendor they knew, creating a lock-out-spec for that vendor's products.
- You forgot to put in the error disclaimer. You made several last minute changes to correct problems related to last minute technical discoveries. The changes introduced more errors than you corrected.

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**B-254**

## You Issue the RFP (1)

- A spectacular new product is introduced. You forgot to leave yourself a method to amend your RFP.
- Your preferred vendor is five minutes late in delivering their bid. You forgot to add a method to extend the RFP deadline.
- You like parts from more than one vendor. Your RFP did not allow you to mix and match.

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**B-255**

## You Issue the RFP (2)

- You did not put in the 'legal' to deny the cost of responding to the RFP. Three vendors bill you and go to court.
- You do not like any of the responses. You forgot to put in the 'legal' to cover 'no award'.
- You forgot your non-disclosure agreement. Your competitors now know how you do business to a very fine level of detail.

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**B-256**

## You Evaluate the RFP Responses (1)

- Your RFP response evaluation committee excludes you from their meetings.
- The evaluation committee assigns the wrong values or scores to the evaluation criteria you selected.

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**B-257**

## You Evaluate the RFP Responses (2)

- Someone changes the evaluation criteria and two vendors sue.
- You are told to manage the evaluation scoring so that a newly acquired division will win the contract.

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**B-258**

# Document Management, Document Imaging

## A Vendor Wins the RFP (1)

- The winning vendor does not meet the specifications and you cannot explain, nor can your committee understand, the differences between the vendor's specifications and the RFP requirements.
- (Ditto for differences in the specifications between what is delivered and what was specified by the vendor.)

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**B-259**

## A Vendor Wins the RFP (2)

- You realize that this project will cost more than any other project ever undertaken by your organization.
- You remember someone saying that this was a "You bet your job" deal.

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**B-260**

## Installation Starts (1)

- All time and materials work requires \$300 dollar per hour people from your vendors headquarters.
- Everything becomes time and materials.
- Your vendor moves, merges, is purchased, goes out of business. Twice.

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**B-261**

## Installation Starts (2)

- The documents you were going to image:
  - Increase by 300 percent
  - Disappear in a merger
  - Are changed to light blue NCR (No Carbon Required) paper with light blue type
  - Are replaced by documents that come in 57 formats and 16 sizes.

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**B-262**

## Alternatives to an RFP

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**B-263**

## Phased Approach: Under the Bar (1)

- Know what dollar amount requires an RFP.
- Small expenditures are easier to explain if something goes wrong.
- Mid-course corrections are hard.
- Get finished often so you can see where you are -- often.

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**B-264**

# Document Management, Document Imaging

## Phased Approach: Under the Bar (2)

- Every installation is a learning experience.
- The faster you can get done, and apply the learning to the next phase, the better.

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## Planning (1)

- A phased approach depends on good planning.
- Use what the vendor has. Force is expensive, let the market place do it. Wait until next year.

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## Planning (2)

- Careful planning and a good understanding of the technology is required so that the little pieces build a system and not just a collection of little pieces.
- Vendors are pricing alternatives with pilot systems in mind.

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## Paradigms & References

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## For More Information . . .

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## For More Information . . .

- Certifications
- Organizations
- Magazines
- Websites
- Shows
- Catalogs

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# Document Management, Document Imaging

## Certifications

- CRM (Certified Records Manager)
- CDIA (Certified Document Imaging Architect)
- CNE (Certified Network Engineer) (Novell)
- MSxx (Microsoft Certified Professional)
- MIT (AIIM Master of Information Technology)
- LIT (AIIM Laureate of Information Technology)
- CA (Certified Archivist)

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## Organizations (1)

- AIIM (Association for *I*nformation and *I*mage *M*anagement)
  - +1 (800) 477-2446 +1 (301) 587-8202
  - <http://www.AIIM.org>
- ARMA (Association of *R*ecords *M*anagers and *A*dministrators)
  - +1 (800) 422-2762 +1 (913) 341-3808
  - <http://www.ARMA.org>

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**B-272**

## Organizations (2)

- PRISM International (*P*rofessional *R*ecords and *I*nformation *S*ervices *M*anagement International) Formerly ACRC (Association of Commercial *R*ecords *C*enters) +1 (800) 336-9793 +1 (919) 881-0677 <http://www.PRISMIntl.org>
- SAA Society of American Archivists
- SCA Society of California Archivists

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## Organizations (3)

- LRMA (*L*egal *R*ecords *M*anagement *A*ssociation)
- SLA (*S*pecial *L*ibraries *A*ssociation)
- ASIS (*A*merican *S*ociety for *I*nformation *S*cience)
- ACP (*A*ssociation of *C*ontingency *P*lanners)
- ASQC (*A*merican *S*ociety for *Q*uality *C*ontrol (ISO 9000))
- Xplor (Print on Demand)
- GCA (*G*raphics *C*ommunications *A*ssociation) (Printing) +1 (703) 519-8160
  - SGML (*S*tructured *G*eneralized *M*arkup *L*anguage)

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## Magazines (1)

- Adobe Magazine +1 (206) 628-2321
- Advanced Imaging +1 (516) 845-2700
- Computer Telephony +1 (215) 355-2886
- Document Management +1 (602) 585-5580
- Government Information and Imaging Technology +1 (301) 445-4405
- Imaging +1 (800) 999-0345, +1 (800) 542-7279

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## Magazines (2)

- Imaging Business (Resellers) +1 (301) 340-1520
- Imaging World +1 (207) 236-8524
- Inform (AIIM) +1 (800) 477-2446
- Law Technology +1 (800) 888-8300
- PC Week +1 (609) 786-8230 (A must for computing)

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**B-276**

# Document Management, Document Imaging

## Magazines (3)

- Print on Demand Business +1 (212) 961-1906
- Southern California Micro Publishing News +1 (310) 371-5787
- Windows NT Magazine +1 (800) 621-1544
- Back Office Magazine +1 (918) 832-9252

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**B-277**

## (Hint)

- Use magazines as a vocabulary test
  - . . . And as a vocabulary builder.

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## Shows

- AIIM, Early April (Biggest)
- Comdex Fall, November, Week before Thanksgiving, Las Vegas (every year)
- Computer Telephony, March, Los Angeles Convention Center +1 (215) 355-2886
- Documation (SGML) (GCA) March
- Legal Tech, June, Los Angeles, (Good Show) +1 (212) 877-5619

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## How do I Keep Up? - Websites

- Microsoft Press Release Page
  - <http://www.Microsoft.com/presspass/todaynews.htm>
    - This is a good page to use as your Internet start page
- PC Week
  - <http://www.ZDNet.com/PCWeek/>
    - e.g. — Internet2 will link 150 educational institutions at OC 192 (Optical Carrier) (10 Gigabits per second) starting February 24, 1999 using SONET (Synchronous Optical NETwork) links donated by Qwest Communications

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## Catalogs

- Light Impressions (Archival Supplies) +1 (800) 828-6216
- See Also: Guides for Shows

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## Books

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# Document Management, Document Imaging

## Books as Computer Printouts of Library, Archival, and Museum Materials

- Treasures of the Library of Congress by Charles A. Goodrum / Published 1991
- The National Archives of the United States by Herman J. Bicla / Published 1984
- The Smithsonian : 150 Years of Adventure, Discovery, and Wonder by James Conaway / Hardcover / Published 1995
- Treasures of the Smithsonian by Edwards Park / Published 1994

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## This is a Good Records Management Book To Have on Your Book Shelf

- Even if you don't read it.
- Information and Records Management
  - By Mary F. Robek, et al.
  - Published by Glencoe
  - ISBN 0-02-8017923-5
  - Available from ARMA +1 (800) 422-2762
- So that when you need it, you will have it.

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## XML

- The Xml Handbook (Charles F. Goldfarb Series) by Charles F. Goldfarb, Paul Prescod

## Unicode

- The Unicode Consortium. *The Unicode Standard, Version 3.0*  
Reading, MA, Addison-Wesley Developers Press, 2000. ISBN 0-201-61633-5.

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## The Best Bill Gates Book I have Read

- Gates: How Microsoft's Mogul Reinvented an Industry - and Made Himself the Richest Man in America
  - By Stephen Manes and Paul Andrews
  - Simon & Schuster 1993
  - ISBN 0-671-88074-8

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## Since the Book was Published

- Bill has quadrupled his fortune.
- Bill is about to add a zero.
  - (CentiBillionaire, USD)
- He may add another zero in the next ten years.
  - His nickname was once Trey.
- Bill tithed in 1999. US\$ 17 Billion.

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## The Best NT Social History (UnAuthorized) I have Read

- Showstopper, The Breakneck Race to Create Windows NT and the Next Generation at Microsoft
  - By G. Pascal Zachary
  - The Free Press (Div. of Macmillan, Inc.)
  - ISBN 0-02-935671-7

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# Document Management, Document Imaging

## **The Best NT Social History (Authorized) I have Read**

- Inside Windows NT
  - By Helen Custer
  - Foreword by David N. Cutler
    - Microsoft Press
    - ISBN 1-55615-481-X

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## **Nanotechnology**

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## **Nanotechnology**

- Is based on molecular machines.
  - <http://www.foresight.org/>
- Will replace computers by the year 2050.
  - And all of technology as we know it.
- Example (Juan Ponce De Leon (1460?-1521)):
  - In vivo correction of all DNA errors that build up over time in all cells.
- One of the few things that will still be of interest will be the records you have kept.

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## **Vision and Systems Success**

- Microsoft is Bill Gates' vision.
- Nanotechnology is Eric Drexler's vision.
- Your Library, Archives, Museum, Records Center, and document management systems will spring forth from your vision.

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# *Thank You*

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## **Document Management, Document Imaging**

3 Days: Thursday, September 30, 1:00 PM to 9:00 PM, Friday, October 1, 10:00 AM to 8:00 PM, and Saturday, October 2, 1999, 9:00 AM to 5:00 PM

Course 814.14, Reg#D7804U, on the UCLA Campus, Department of Engineering, Information Systems & Technical Management (EISTM), UCLA Extension, +1 (310) 825-4100

Grading: 2.1 CEU (Continuing Education Unit): no grade assigned

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