Introduction to Document Management

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Goal of Tutorial

To help you to understand the fundamental changes which are occurring in the field of document management and their relationships to process and technology alternatives.

Fundamental Changes

- Just now learning to use computers to improve organizational performance.
- Destabilizing the nature of work
  - Organizational purpose
  - How individuals contribute value
- Document management “in the cross-hairs”
  - Concept of the document
  - Measures of value

Hidden Importance

- P 80-90% of corporate information in documents
- P Documents claim
  - < 40-60% of office worker’s time
  - < 20-45% of labor costs
  - < 12-15% of corporate revenues
- P Emerging metaphor for organizing complex information

Documents as Strategic Assets

P Contain information critical to complex organizational behaviors

< Provide context

< Integrate, document, and communicate understanding

P Critical to customer satisfaction

P Inconsistently recognized as strategic

< Real men do databases

< CALS, ATA 2000, ISO 9000, etc.

What the Tutorial Will Cover

P What is Document Management

P The History of Document Management

P Document Management Architectures

P Implementation Issues

P Workflow Automation

P Integration Points

P Impact of the World Wide Web

What is Document Management?

Simple Definition

Systems for managing collections of documents

Wide disparity of approaches

- Document Image Management
- Full Text Retrieval
- Compound Document Management
- Online Viewing
- Workflow
- Object-Oriented Databases

What is Management?

Actions taken today to protect the future

Protecting the Future

P Do all your documents (or the information in them) have the same future?

< “One size fits all” solutions are a common mistake

P How much will the future cost?

< Cost = (Legacy, Vision)

P Future value is defined in terms of human and automated behaviors

Metadata Determines Future Value

P Metadata = data about data

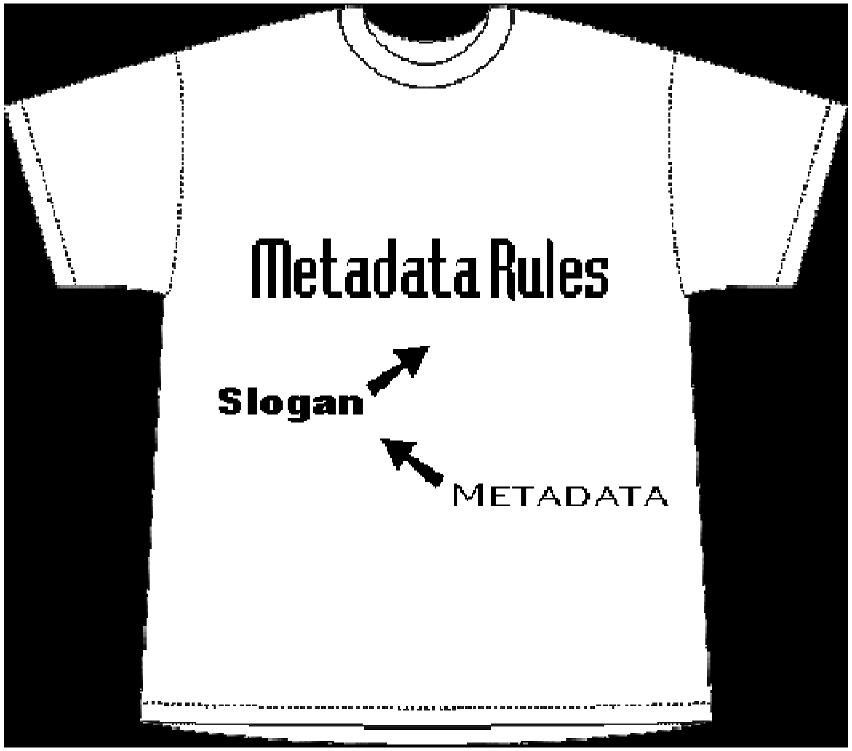
P Metadata is the basis for behavior

P Humans can create metadata and resolve ambiguous metadata

P Computers can’t

P Documents are often rich in ambiguous metadata

P Are your documents “smart enough” to meet future needs?



What is Document Management?

P Document Management processes and technologies protect the future value of documents.

P A wide variety of approaches have been developed which are based on different concepts of the document and emphasize different definitions of document value.

History of Document Management Systems

History Overview

P Mirrors the evolution of the concept of the document

P Conceptual changes closely tied to technology and metadata changes (chicken and egg)

P Three primary concepts

< Paper documents

< Automated paper documents

< Electronic documents

Paper Documents

Focus on the dynamics of the physical artifact

P Metadata implied through visual clues

- < Linear sequence
- < Typography and formatting
- < TOC, lists, indexes, cross references, etc.

P Human interpretation creates meaning

P Efficient use of space often more important than retrievability and reuse

P Innovations target the independent efficiency of production, storage, and retrieval

Automated Paper Documents

Speeds the processing of physical documents

P Paper hides a multitude of sins

P Focus on visual formatting

< Laser printers allow more control

< HW/SW tools function like fast, powerful pens

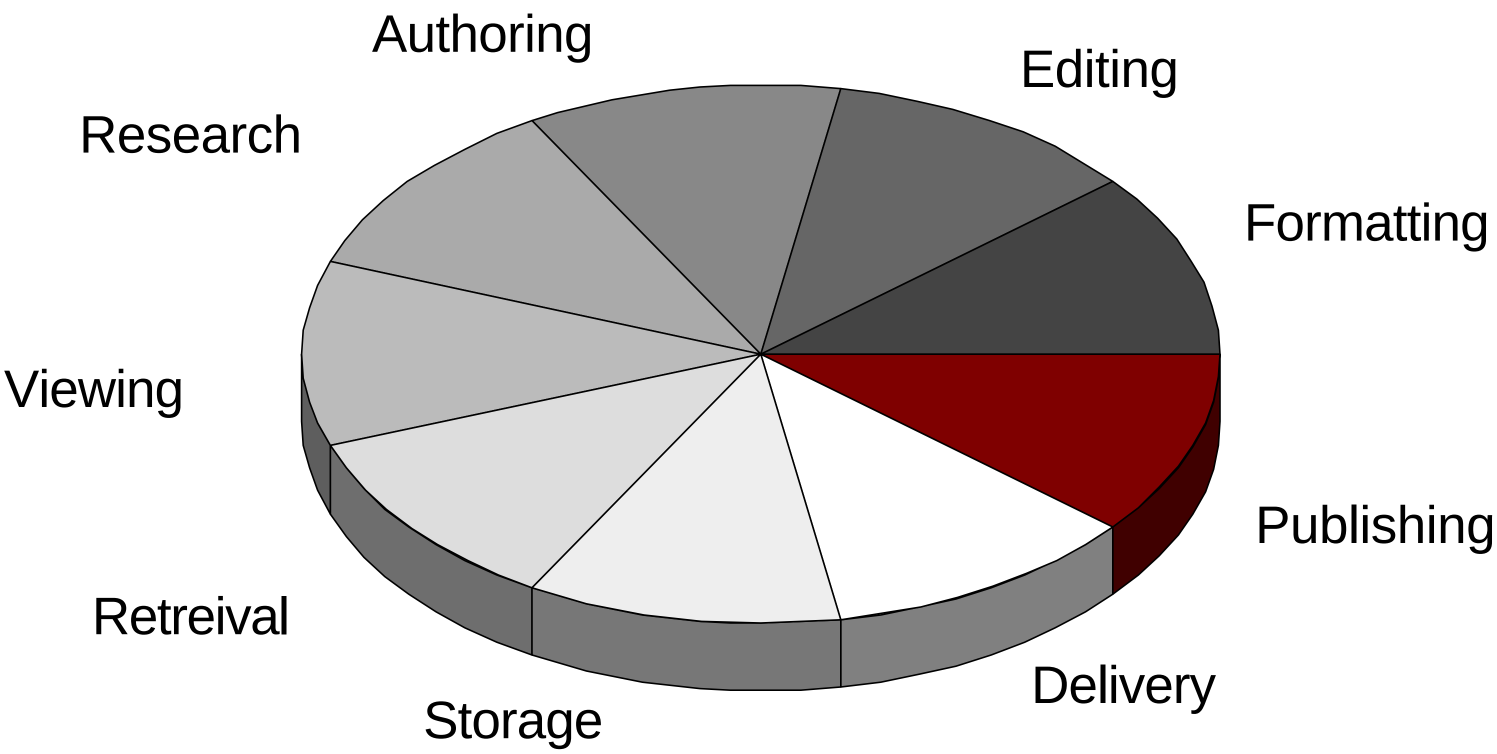
< Metadata / operator interaction based on formatting codes

P Illusion of control

P Management of meaning and semantics limited to relational database world

Automated Paper Documents

Solutions often focus on a subset of the document lifecycle



Automated Paper Documents

Technologies

P Paper-based interface standards

P Graphics, Wordprocessing, and Desktop Publishing tools

P Manage information *about* the documents

< File management systems

< Image management systems

< Other database-based indexing systems

Electronic Documents

Conceptual Shifts

P Increased information density

P Documents are more than their paper representations

  < Time-based media

  < Hyperlinks and other navigational aides

  < Formal relationships to other sets of information

P Paper becomes a portable, high-resolution display technology

Electronic Documents

Conceptual Shifts

P Processing-neutral encodings that support multiple representations for delivery

P Emphasis on meaning and semantics

  < Richer, more descriptive metadata that serves as a basis for integrating the entire document lifecycle

P Tied to new organizational models that are based on shared pools of information

Electronic Documents

Performance

P Time and quality become dominate values

< Use and reuse of knowledge

< Customer satisfaction

P Performance and value increasingly limited by production process

P Increased importance of up-front design

< Formalized structures and validation

< Explicit metadata that supports complex human and automated behaviors

< Software and data interfaces

Electronic Documents

Technologies

- P Manage information *contained in* documents
- P Data encodings as interface standards
- P Structured authoring
- P Hypermedia authoring (including links, annotations, workflow, other relationships)
- P Component management systems
- P Convergence of competing concepts

What is Document Management?

Revisited

P Today’s high-performance documents are based on relationships

P Emphasis is shifting away from

< Simple storage and retrieval

< Independent management of life cycle phases

P New emphasis on integrating interrelated information lifecycles

P Systems often encompass competing concepts of the document

Overview of Document Management Architectures

Overview

- Three models
  - Image-based
  - WYSIWYG DTP
  - Compound document management
- Components
  - Data encoding standards
  - Software interoperability standards
  - Task-specific tools
  - Communications and repository infrastructure

Image-based Architectures

- Dragging paper documents into the electronic age
- Heavy reliance on human interpretation
- Layering of metadata to capture meaning and understanding
- Workflow automation and annotation innovations

WYSIWYG DTP

P Control of visual aspects

P File-based and BLOBS

P Production focus

P Short-lived documents

< Advertising
< Novelty
< Drama

P WWW

Compound Document Management

- Control of individual information objects
- Structure and semantics
- Late binding of typography
- Customization of both form and content
- Addressing and transformation issues
- Encompasses and consolidates other architectures

Data Encoding Standards

General Questions

- Who controls the standard?
- What classes of metadata (conceptual models) does it support?
- What behaviors does it support?
- Portability, platform independence, ability to support required transforms

Data Encoding Standards

Text

- Paper
- Image
- Text
- Page image
- Traditional markup
- Generalized markup

Data Encoding Standards

Graphics

- Paper
- Image
- Vector
- Semantically-rich vector graphics

Data Encoding Standards

Other

- P Audio
- P Video
- P Voice
- P Positional
- P Hyperlinking
- P Rendering
- P Behaviors

Software Interoperability Standards

- Programming languages
- Application Programming Interfaces
  - Single vendor
  - Vendor consortium
- Examples
  - Shamrock, DEN, ODMA, OLE, OpenDoc, CORBA
- Stability

Task-Specific Tools

Authoring

P Traditional

- < Word processing and DTP
- < Graphics

P Structured authoring

- < SGML/HTML
- < Forms
- < Graphics

P Layering

- < Browsers

Task-Specific Tools

Editing

- Heavily reliant on human interpretation
- Syntax checkers and validators
  - Content (spelling, grammar)
  - Markup
- Batch vs real-time

Task-Specific Tools

Formatting & Publishing

P Converters

< Scanners

< OCR/vectorizers

< Programmable

P Composition tools

P Physical media and associated hardware

P Hypermedia authoring tools

P Print on demand

Task-Specific Tools

Delivery & Storage

P Dependent on published form

P Relational and object-oriented databases

< Square pegs

< Tables, hierarchies, and non-linear relationships

< Performance

< Data model designs

< Granularity

P Email, workflow, other network-based transport mechanisms

Task-Specific Tools

Retrieval

- P Database queries
- P Full text
  - < Boolean searches
  - < Weighted thesauruses
  - < Vector searches
  - < Context-sensitive searches
  - < Natural language
- P Image matching

Task-Based Tools

Viewing

- Text readers
- Native file viewers
- Raster viewers
- Page viewers
- Binary browsers
- Fixed markup language browsers
- Arbitrary DTD browsers

Infrastructure

- Repository and communications subsystems
- Scope
- Granularity
- Encodings
- Versioning and configuration control
- Target of most software interoperability standards

Implementation Issues

Human Issues

P Difficulty of adopting enabling technologies

- < Conceptualization
- < Learning
- < Foresight

P Perceptions

- < Technology problem
- < Uniqueness

P Who knows?

Organizational Issues

P Reengineering

< Complex behavior based on richer semantics

< Self-awareness

P Information politics

< Stakeholder interests

< Policy development & governance

< Allocation of decision making

P Competing interests of information owners and technology vendors

Technical Issues

P Adequate communications infrastructure

P Cross-platform integration

P Selecting standards

P Legacy systems and data

P Addressing and granularity

P Planning for obsolescence

P Labor costs

Workflow Automation

Issues

- Often confused with document management
  - Check-in and check-out
  - Component-level configuration control
- Convergence with document management
  - Routing and communication
- Ad hoc vs engineered workflows

Opportunities

P Basic reengineering model

< Shift from linear flow to shared pools

< “Linear” process flows still remain

P Documenting transformations provides additional context to information objects

< Facilitates understanding

< Simplifies reuse in new contexts

P Additional “publishing vectors”

Integration Points

Organizational Integration

- Information suppliers and consumers
- Metadata requirements
- Process, policy, politics
- Values

Data Integration

- P Encoding standards
- P Software interoperability standards
- P Transformations
- P Addressing
- P Synchronization

Impact of the World Wide Web

Primary Impact

First time that a large number of individuals and organizations have used non-proprietary, vendor-neutral encoding and communications standards to implement a truly heterogeneous computing environment.

Additional Impacts

- Encoding standards
- Software design
- Focus for consolidation

Encoding Standards

P HTML hides a multitude of sins

P A application of SGML

< Conformance issues

< Volatility

< Theology

P Easy to get into

P Danger in thinking that more than a delivery encoding

Encoding Standards

P Simplicity limits utility and drives divergent publishing models

< Complex graphics

< Structured data at the server

P Competing/complementary efforts

< Stupid HTML export

< Proprietary encodings

< Increased visual sophistication

< Structural flexibility

P XML Initiative

Software Design

- Viewer-centric
  - Customized views
  - “Do everything” browsers
- Smaller apps (e.g., plug-ins, java applets)
- Platform independence
- Authoring metaphors

Focus for Consolidation

P Aim for the accident

P Change changes change

< Perceptions of value

< User needs

< Vendor desires

Conclusion

- Use encodings as primary integration mechanism
- Choose tools that let you control metadata structures and object granularity
- Layer new relationships and meanings as identified
- Engage stakeholders in all phases of document lifecycle to identify metadata requirements