

# ACP

AMERICAN COLLEGE OF PHYSICIANS  
INTERNAL MEDICINE | *Doctors for Adults*

## ELECTRONIC WORKFLOW

**SSP Technology Blitz**  
**Philadelphia, PA**  
**November 18, 2004**

# About the American College of Physicians

- The nation's largest medical specialty society
- 116,000 physician members specializing in internal medicine and its subspecialties
- Staff of 350 located mostly in Philadelphia
- Not-for-profit

# ACP's premier publications

- *Annals of Internal Medicine*: An original research journal; published twice monthly
- *ACP Journal Club*: A secondary research journal; 6 issues per year
- Physicians' Information and Education Resource (PIER): An online clinical guidelines database; continuously published and updated
- Medical Knowledge and Self-Assessment Program (MKSAP): A multipart Continuing Medical Education (CME) product; published every 3 years

# Other publications produced by ACP

- About a dozen downloadable PDA products
- About a dozen new book titles per year
- Web support for our Annual Session, the world's largest internal medicine meeting
- A wide variety of other CME products and ACP member services available in print and online
- Eleven Web sites totaling over 277,000 HTML pages
- Many products also available on CD-ROM and/or through third-party licensing partners such as Ovid

# Five years ago: a very traditional environment

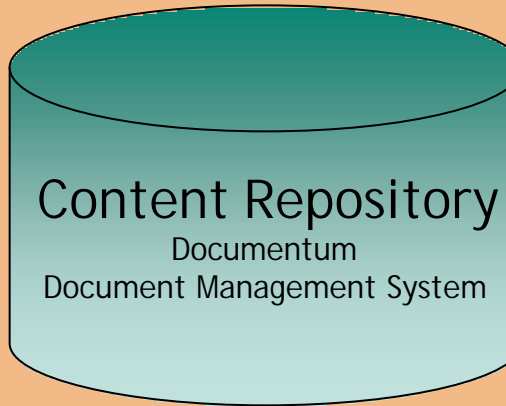
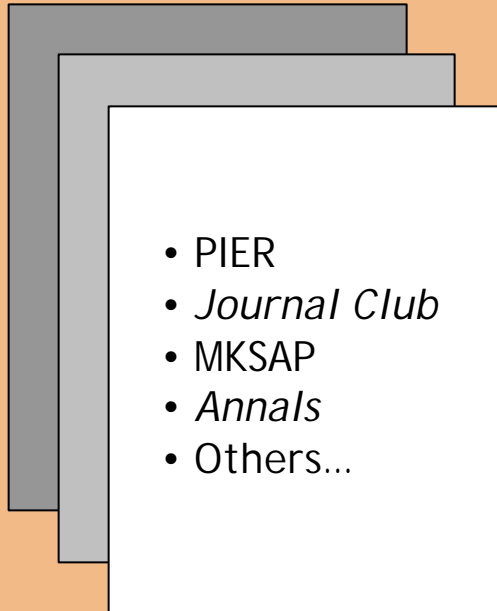
- Autonomous content factories or “silos”
- Inherently incompatible technologies
- Product-specific workflows
- Uncoordinated content development efforts resulting in overlapping content
- Linear workflows to produce multiple deliverables from each product’s content

# Pursuit of a new strategy: content ubiquity

- Readily accessible to authorized ACP staff and ultimately, under access control, to authors, peer reviewers, and end users
- Cohesively indexed and searchable in a variety of methods so that interrelated subject matter is easy to find regardless of its originating source
- Deliverable through automated systems that support the ACP's ability to publish the right information in the right form at the right time to the right audience

# Content Development/Deployment Conceptual Design

## Content Creation



## Content Deployment

### Print Products

- *Annals of Internal Medicine*
- MKSAP
- *ACP Journal Club*



### Electronic Products

- PIER
- acpjc.org
- annals.org
- MKSAP
- PDAs
- e-commerce



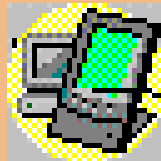
### Business Partners

- Allscripts
- NextGen
- StatRef
- Skyscape
- Ovid
- EBSCO
- Infotrieve



### Other Products

- Hybrid Web sites
- Clinical decision support tools



# Today: a new, integrated environment

- A common infrastructure
- Shared templates, programs, and editorial tools
- Collaboration and coordination of content development efforts
- A single workflow to produce multiple deliverables from the same content
- A common way of work for all products

# Our guiding principles

- Never sacrifice quality to achieve higher productivity
- Never sacrifice productivity to achieve higher quality
- Attempt to improve BOTH quality and productivity with every change

# What is “electronic” workflow?

- Paperless editorial production
- Computer-assisted editing
- Computer-transformed renderings
- DMS-driven process
- DMS-executed tasks

DMS = Document Management System

# Paperless editorial production

- Author-submitted manuscript
- Copyedited manuscript
- Unpaginated galleys
- Page proofs
- Bluelines

# Computer-assisted editing

- Editorial macros
- “Cleanup” routines
- “Edit-checker” routines
- Scripted global search-and-replace
- Online reference checkers
- Metadata insertion programs
- XML transforms for reorganizing content or changing tagging structures

# Computer-transformed renderings

- Word-to-XML
- XML-to-Xyvision XML
- XML-to-Quark
- XML-to-HTML
- XML-to-PDF
- XML-to-PDA
- XML-to-partner-specific output
- XML-to-Word (one-way or round-trip)

# DMS-driven processes

Routine DMS tasks previously performed by hand are now automated, such as:

- Automated import and export
- Automated check-in, check-out, and parsing
- Automated promotion to next lifecycle stage
- Automated rollup and chunking of XML
- “Task-ready” email alerts to next editor
- Automated status reporting

# DMS-executed tasks

Non-DMS-related editorial tasks previously performed by human editors are now executed in an entirely unassisted manner by the DMS:

- Automated “cleanup” routines
- Automated content transformation
- Automated retention policies

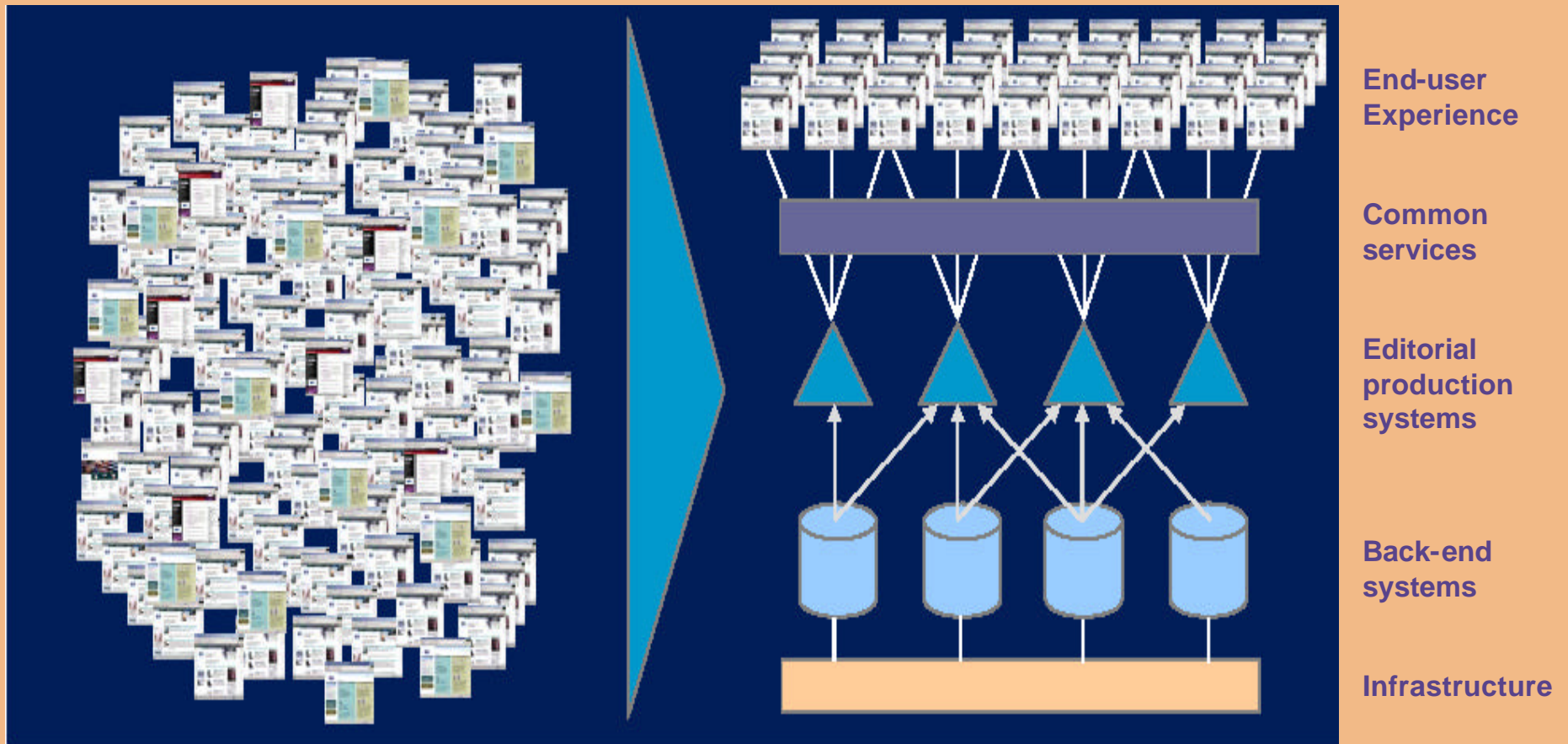
## The workflow is less rigid but more complex

- The flexibility needed to respond to new opportunities drives the optimization of production for existing products
- Every change has an impact on everything else
- Quality assurance surfaces problems with the data that were never noticed in print
- Workflows are moving targets that are constantly being tested and tweaked
- The number of precomposition steps increases, but many are automated using plug-ins
- Most new steps can be carried out by editorial assistants

# It may appear "busier," but it's not chaotic

## BEFORE

## AFTER



# Lessons learned (so far)

1. Implementing XML backwards up the workflow, step by step, not all at once, causes the least disruption and the most immediate benefits.
2. Justifying each change in terms of clear, specific, and immediate benefits to productivity, quality, and deliverability determines what step is next.
3. Completing tiny steps and using the editors for testing and implementation avoids dropping a "black box" like a bomb on the editorial staff and builds editorial competence, trust, and ownership.

## Lessons learned (so far)

4. Developing, testing, and implementing a live but lower risk “pilot” project first ease the sharing of a new capability with other products because the benefits are already proven and the procedures are already shaken out.
5. Separating content from presentation enormously simplifies content development. Use Cascading Style Sheets (CSSs) and XML transformations (XSLTs) to render content for print composition and electronic presentation.
6. Planning, organizing, and documenting the new production process are very necessary steps but also very labor-intensive.

## Lessons learned (so far)

7. Developing applications programming capabilities within your staff results in flexibility and reusability. We rely on the corporate IT function only for hardware, systems software, and network infrastructure. We outsource programming only when absolutely necessary and then transfer the technology to internal staff upon completion.
8. Encouraging editors who are inclined by interest and aptitude to consider a programming career path produces very informed technical skills.
9. Using project leaders with real-life “been to the mountain” experience provides champions and cheerleaders who can give encouragement, direction, and reassurance to the staff.