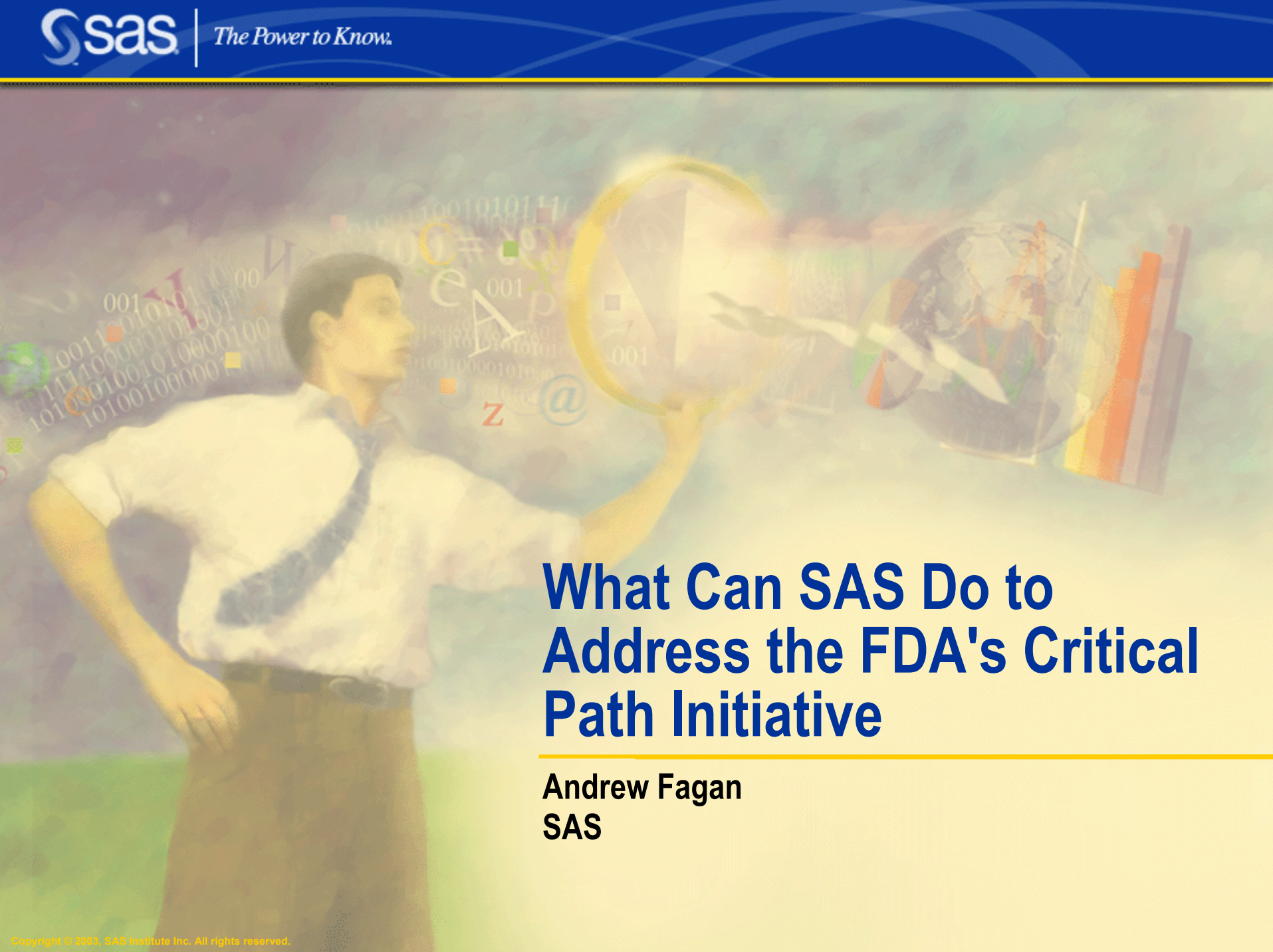

What Can SAS Do to Address the FDA's Critical Path Initiative

Andrew Fagan
SAS

Outline

- What is the FDA's Critical Path Initiative
- Why is it important to all of us
- What is SAS doing in some of the areas identified by the FDA

What is the FDA's Critical Path Initiative

- Described in paper released March 2004
- Outlines some of the issues the FDA sees with the current medical product development process
- Proposes that both the process and technology used need to change. And change together.
- FDA may be US-centric, but the issues they have identified are global

Some of the points made in the FDA's Critical Path Initiative

- There is a dip in the new drugs pipeline
- Causes identified:
  - Genomics and other new science not at full potential
  - Mergers and other business arrangements have decreased candidates
  - Easy targets already taken; chronic diseases are harder to study
  - Failure rate has not improved
  - Increasing costs and complexity decrease willingness to bring many candidates forward

Janet Woodcock FDA, January 2005

Statistics pointed out by the FDA

- Number of NME is decreasing
  - According to FDA statistics, the peak in new medical entities filed occurred in 1996 and 1997 and has generally fallen since
- Failure rate has not improved
  - New compounds entering Phase I development today have an 8% chance of reaching market vs. 14% chance 15 years ago
  - Phase III failure rate now reported to be 50% vs. 20% 10 years ago

Janet Woodcock FDA, January 2005

Additional points concerning the FDA's Critical Path Initiative

- Current pharmacological models have reached their peak
- Specific product development versus therapeutic area research
- Standards are lacking

Table 1: Three Dimensions of the Critical Path

Dimension	Definition	Examples of Activities
Assessing Safety	Show that product is adequately safe for each stage of development	• Preclinical: show that product is safe enough for early human testing Eliminate products with safety problems early • Clinical: show that product is safe enough for commercial distribution
Demonstrating Medical Utility	Show that the product benefits people	• Preclinical: Select appropriate design (devices) or candidate (drugs) with high probability of effectiveness • Clinical: Show effectiveness in people
Industrialization	Go from lab concept or prototype to a manufacturable product	• Design a high-quality product - Physical design - Characterization - Specifications • Develop mass production capacity - Manufacturing scale-up - Quality control

Safety

- No institutional memory
- Predictive modeling difficult at best
- The FDA can not look across all of the studies they have reviewed

Efficacy

- No institutional memory
- Predictive modeling difficult at best
- The FDA can not look across all of the studies they have reviewed
- Science is not advanced enough
  - Proteomics, genomics, biomarkers
  - Processes for measuring efficacy not indisputable

Manufacturing

- In most cases, no way to look at the manufacturing process real time and assess the quality
  - Run, sample, test, repeat …

Why should this be a concern to all of us?

- The FDA is trying to address a fundamental problem they see in public health
- The influence of the FDA overshadows much of what we do
- Most of what they point out is not news

SAS …

- So what is SAS doing in these areas?

Scientific Discovery Solutions

- SAS is building a full suite of tools and applications in the discovery space
- Microarray
  - Expression - significant gene expression
- Proteomics
  - Biomarkers – find associations
- Genetic Marker
  - Genotyping – assess variability
- Bioassay
  - Future functionality

Standards …

- CDISC involvement
  - Corporate Sponsor
  - Board of Directors Member
  - Working group members for ODM, ADaM, and define.xml
  - CDISC standards to be operational in all SAS software
- SAS views CDISC and HL7 as critical to the re-engineering push underway at the FDA

CDISC Functionality

- Proc CDISC
- SAS CDISC viewer
- XML Engine ODM Native mode
- XML Engine and XMLMap Extensions
- New base SAS formats/informats for ISO-8601
- CDISC data and metadata templates for ETL Studio
  - Data quality programs to validate quality

SAS Drug Development

- SAS Drug Development is the collaborative framework that provides a compliant environment for clinical research
- Brings together all of the SAS pieces needed
- Open architecture and framework to facilitate integration with existing (and future) tools
- Allows for more interaction between sponsors and the regulatory body

Manufacturing

- SAS Enterprise Business Analytics for Production Quality
  - Designed to help medical device and pharma manufacturers find quality issues and avoid them in the future
  - Incorporates the SAS 9 BI architecture, Enterprise Miner, and industry knowledge

Business Intelligence

- Bring query and analysis tools to the end [non-technical] user
- In life sciences, how Business Intelligence is applied is crucial
  - For regulated activities, use SAS Drug Development
  - For other activities, use Business Intelligence
    - How many (patients, pages, queries)…
    - When will (enrollment, recruitment, submission)…
    - What if ….
- What constitutes Business Intelligence? Add-in for Microsoft Office, WebReportStudio, Enterprise Guide, etc

Summary

- SAS is very involved in emerging standards for data and metadata
- We will continue to drive industry requirements into our technology at all levels
- Much of what the FDA is outlining cannot be solved without cooperation between the industry, the government, other technology vendors and the regulatory agency
- Science must evolve also, not just the technology

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