

KEY VOCABULARY

Term	中文	Meaning / use
legacy reporting pipeline	遗留报告流程	An established reporting system that contains valuable validated logic but is difficult to modernize.
non-destructive modernization	非破坏式现代化	Adding a new layer around validated software without requiring immediate source-code replacement.
intermediate representation	中间表示（IR）	A structured machine-readable layer between statistical computation and final rendering.
bridge map	桥接映射	Metadata that connects legacy components to new standardized interfaces.
coexistence mode	共存模式	A deployment state where legacy and modern components operate together.
incremental consolidation	渐进式整合	Replacing selected legacy components gradually rather than rewriting the whole system.
parity validation	一致性验证	Comparing old and new outputs to quantify whether the same analytical result is preserved.
cell-level parity	单元格级一致性	Agreement between corresponding cells in two report outputs.
format-agnostic	格式无关的	Designed so the same result can be rendered to RTF, PDF, HTML, JSON, or another format.
machine-readable	机器可读的	Structured so software and AI systems can consume the content directly.
provenance	来源与执行谱系	Evidence showing how an output was produced, including inputs, versions, steps and review actions.
execution manifest	执行清单	A structured record of the programs, parameters, inputs and environment used in one run.
separation of concerns	关注点分离	Keeping computation, formatting, rendering and orchestration as distinct responsibilities.
regression risk	回归风险	The risk that changing existing code unintentionally changes validated behavior.
metadata-driven configuration	元数据驱动配置	Defining report behavior in structured configuration rather than hard-coded program logic.

USEFUL PHRASES

1. **wrap validated logic rather than rewrite it** - *The first modernization step can wrap validated logic rather than rewrite it.*
2. **decouple statistical computation from rendering** - *The IR decouples statistical computation from rendering.*
3. **expose results as machine-readable data** - *The pipeline exposes results as machine-readable data.*
4. **preserve regulatory-grade analytical logic** - *The architecture preserves regulatory-grade analytical logic.*
5. **introduce change behind an explicit interface** - *New components are introduced behind an explicit interface.*
6. **validate equivalence at the cell level** - *The team validates equivalence at the cell level.*
7. **make provenance reconstructable** - *Every execution should make provenance reconstructable.*
8. **replace hard-coded parameters with structured metadata** - *The framework replaces hard-coded parameters with structured metadata.*
9. **reduce migration risk through coexistence** - *Coexistence can reduce migration risk during modernization.*
10. **treat AI access as an interface problem** - *The paper treats AI access as an interface problem rather than a code-generation problem.*

COMPREHENSION QUESTIONS

1. Why can a full rewrite be risky for a mature regulated SAS reporting library?
2. What role does the intermediate representation play between computation and rendering?
3. Why is cell-level parity more informative than visual comparison alone?
4. How does CDISC ARS reinforce the paper's machine-readable-results argument?
5. Which modernization tasks are good early candidates for AI, and which should remain deterministic?

RETELLING PROMPTS

30 sec: Legacy problem -> wrapper -> validation.

45 sec: SAS -> metadata -> compute -> IR -> reconcile -> render -> AI.

60 sec: Explain why AI-ready does not mean rewriting SAS.

5-MINUTE SPEAKING / OUTPUT TASK

Minute 1: Choose one SAS reporting workflow.

Minutes 2-3: Define what stays legacy, what becomes metadata, and what the machine-readable result contract contains.

Minute 4: Add parity, hashes, manifests and reviewer approval.

Minute 5: Explain which bounded tasks AI may perform first.

ONE SENTENCE TO KEEP

The safest path to AI-ready clinical reporting may be to preserve validated computation, add machine-readable interfaces around it, and modernize only where quantitative parity evidence supports the change.