

2.5.5 Difficulty Proving Comparability Across Systems and Agencies

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One of the central objectives of the [Financial Data Transparency Act \(FDTA\)](#) and comparable regulatory initiatives is to enable meaningful comparison of reported information across agencies, jurisdictions, systems, and reporting periods.

Such comparability supports:

- Oversight
- Longitudinal trend analysis
- Risk assessment
- Supervisory coordination
- Cross-agency analysis
- Coordinated regulatory action

Without a shared architectural framework, comparability depends largely on informal alignment among implementations, tools, definitions, and assumptions.

Even where systems adopt the same reporting standards, schemas, taxonomies, or formats, they may differ materially in:

- [Semantic](#) interpretation
- Rule application
- Versioning practices
- Provenance handling
- Contextual assumptions
- Classification logic
- Temporal treatment
- Calculation methods

These differences often remain implicit or undocumented. As a result, apparently similar data may conceal materially different meanings, derivations, or analytical treatments.

Without explicit architectural support, systems cannot demonstrate reliably:

- Why are two datasets comparable
- Which semantic assumptions support the comparison
- Which definitions and rules apply
- Whether the same version context governs both datasets
- How changes in definitions, rules, or parameters affect comparability over time
- Whether differences arise from source data, extraction, interpretation, or validation

Syntactic validation rarely exposes these limitations. Nevertheless, they directly affect the credibility, defensibility, reproducibility, and auditability of cross-system and cross-agency analysis.

The inability to demonstrate comparability is therefore not merely a data-quality problem or a shortcoming of an individual standard. It is an architectural failure mode that arises when the basis of

interpretation remains implicit, distributed, and unmanaged.

A [Reference Architecture](#) is needed to make the foundations of comparison:

- Explicit
- Identifiable
- Versioned
- Traceable
- Governable
- Reconstructable
- Testable across implementations

Comparability should therefore be demonstrated through declared semantic, structural, temporal, and interpretive conditions rather than assumed from common syntax or shared tooling.

Taken together, the concerns identified in [Section 2.5.1](#) through [Section 2.5.5](#) demonstrate that the principal challenges facing modern reporting systems are architectural.

They do not arise primarily from missing functionality, immature tooling, or inadequate adoption of standards. They arise from the absence of a system-level framework that defines semantic responsibilities and governs how systems interpret, version, preserve, compare, and evolve meaning across independently developed implementations.

The [Federated Data Interpretation Systems Reference Architecture \(FDIS-RA\)](#) provides the foundation for addressing these challenges systematically. By coordinating existing standards, capabilities, responsibilities, boundaries, and governance mechanisms within a coherent architectural framework, FDIS-RA supports:

- Semantic stability
- Controlled evolution of meaning
- Demonstrable comparability
- Traceable interpretation
- Auditability
- Reproducibility
- Mission-critical reliability over time

In regulated and high-consequence environments, where trust, accountability, and explainability are essential, such an architecture is foundational rather than optional.

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