

Reproducibility

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Discussion

Reproducibility concerns the ability to obtain materially equivalent results by applying the same governed inputs, definitions, rules, parameters, versions, and interpretive context.

In regulated data interpretation systems, reproducibility supports confidence that an outcome does not depend on undocumented tool state, hidden assumptions, transient configuration, or uncontrolled implementation behaviour.

Reproducibility requires explicit identification of:

- Source inputs
- Semantic definitions
- Rule versions
- Parameters
- Configuration
- Model or component versions
- Processing sequence
- Interpretive context

Material equivalence does not always require bit-for-bit identity. Some processing techniques, including probabilistic or artificial intelligence-assisted methods, may produce variable outputs. In such cases, the governing architecture defines the acceptable degree and form of equivalence.

Definition

quality permitting equivalent results

Source

- Federated Data Interpretation Systems Reference Architecture (FDIS-RA)
- ISO 5725, Accuracy of measurement methods and results
- ISO/IEC 25010, Systems and Software Quality Requirements and Evaluation

Note

Reproducibility differs from repeatability. Repeatability generally concerns obtaining consistent results under the same conditions and environment. Reproducibility may involve a different system, tool, environment, or implementation while preserving the governed basis of the processing.

Reproducibility also differs from traceability. Traceability explains how a result was produced. Reproducibility establishes whether an equivalent result can be produced again under the declared conditions.

Example

An interpretation is reproducible when an independent implementation can apply the same source information, semantic baseline, rule set, parameters, and context and obtain a materially equivalent result.

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