Insights on Data Conformance Rules – Lessons from TIG v1.0

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Meet the Speakers

Christine Connolly

Title: Head of Standards Projects

Organization: CDISC

Christine Connolly is the Principal Investigator for the Tobacco Implementation Guide (TIG) project responsible for the development and piloting of TIG standards. She has led initiatives, developed, and implemented data standards for over fifteen years and has twenty-five years of experience working in global clinical trials in both academic and pharmaceutical settings.

Els Janssens

Title: DM System and Process Manager

Organization: SGS Pharma – Clinical Research

Els Janssens has 13+ years of experience in Clinical Data Management. In her current role as Data Management System and Process Manager, she focuses on data standards and regulatory requirements and has an active role in the PHUSE EU Connect committee, CDISC E3C, and CDISC Open Rules.

Disclaimer and Disclosures

- *The views and opinions expressed in this presentation are those of the author(s) and do not necessarily reflect the official policy or position of CDISC or SGS.*

- *The authors have no real or apparent conflicts of interest to report.*

Agenda

1. Tobacco Implementation Guide Version v1.0 (TIG v1.0)
2. Putting TIG v1.0 to the Test – The Submission Pilot Project
3. TIG Conformance Rules
4. Building the CDISC Open Rules
5. Looking Ahead

Tobacco Implementation Guide Version 1.0 (TIG v1.0)

Tobacco Implementation Guide (TIG)

Tobacco Implementation Guide (TIG) v1.0 standards are:

- The culmination of a collaborative project commenced by CTP and CDISC in 2021
  - Undertaken by **FDA, CDISC, and industry** stakeholders
- Designed to support the CTP Data Standards Strategy with standards to facilitate tobacco research, scientific review, harm reduction, and information exchange
- Non-proprietary, consensus-based, vendor-neutral, platform-independent submission data standards for tobacco product data published and freely available as of **June 2024**

https://www.cdisc.org/standards/foundational/tobacco-implementation-guide/tobacco-implementation-guide-v1-0

Tobacco Implementation Guide (TIG) v1.0

A single, comprehensive implementation guide designed for use cases unique to tobacco studies

An overview of standards and general implementation

With guidance by topics and use cases; e.g.

- Product Description
- Nonclinical
- Individual Health
- Population Health

Key scientific concepts and maps

Data Collection (*CDASH eCRFs*, *ODM-XML*)

Data Tabulation (*SEND*, *SDTM Human Clinical*, *Define-XML*)

Analysis (*ADaM*, *Define-XML*)

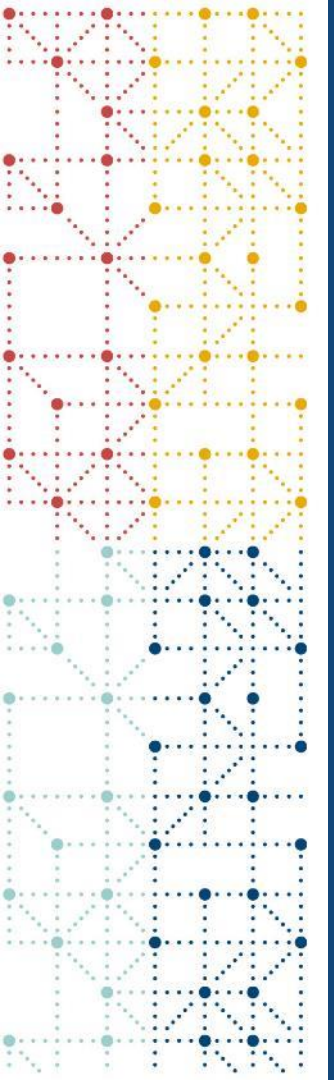
Common Language (*Controlled Terminology*)

Measures of Adherence (*Conformance Rules*)

Accessible in platforms which optimize use (including *CDISC website*, *CDISC Library*)

Education and Outreach (including *webinars*, *formal training*)

#ClearDataClearImpact



Putting TIG v1.0 to the Test

The Submission Pilot Project

TIG Submission Pilot Project

What

- This project is a continuation of the collaboration formed to develop the TIG v1.0 with the goal to support adoption and stakeholder realization of efficiencies.

How

- This project enables standards adoption and efficiencies through hands-on experience and subject matter expert support.

When

- Two years, 2024 June through 2026 June

Who

- CDISC will engage tobacco industry subject matter experts, and other relevant stakeholders through project duration.

Community Benefit Through Hands-on Experience

This project gives participants the ability to pilot TIG standards and resources.

Practice standardization of data for submission with support and training

Design education resources to address community needs

Build a shared framework for long-term collaboration post project

TIG Submission Pilot Project

CDISC Tobacco Implementation Guide (TIG) Team

Initiate Standards Adoption

Up to 9 participants

Preparation for minimal reviewable package (MRP)

MRP validation and feedback

2025 Feb - 2026 May

Future State for Collaboration

All comers!

Document

Framework

2025 Dec - 2026 May

Educate for Adoption of Standards

All comers!

Develop and access

Community resources

2025 Feb - 2026 May

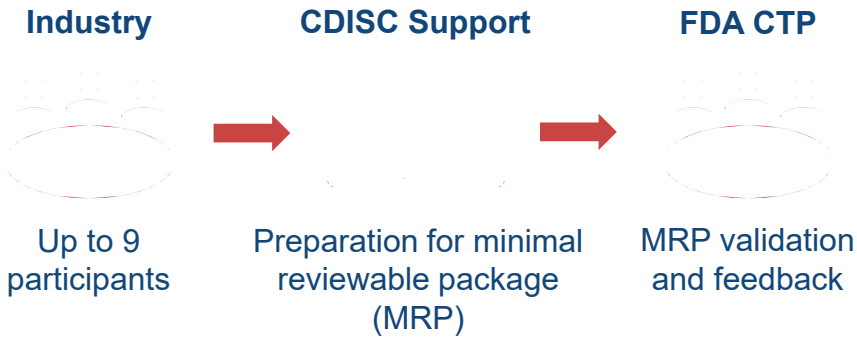
Enable standards adoption and realization of efficiencies through hands-on experience & support.

TIG Submission Pilot Project

Initiate

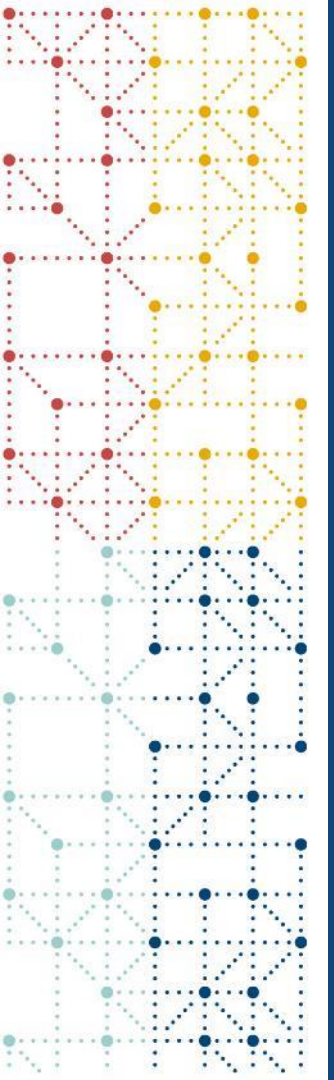
Adopt TIG standards through mock submission package experience

- Industry application of TIG v1.0 standards in the context of a regulatory submission
- Reviewer understanding of standardized data in a way that facilitates product review



Submission Types and Data

- Premarket Tobacco Product Application for ENDS with associated e-liquid(s)
- Substantial Equivalence Report for combustible product(s)



TIG Conformance Rules

Backbone of Reliable Data Validation

Conformance Rules - Recap

- Check data compliance to a specific standard
- Translating standard specifications into rules
- Designed to become programmable
- Standard specific but overlaps are possible

Example of SDTM and SDTMIG Conformance Rules. v3 in progress

Rule ID	SDTMIG Version	Rule Version	Class	Domain	Variable	Condition	Rule	Document	Section	Item	Cited Guidance
CG0257	3.3	1	TDM	TS	TSPARMCD		TSPARMCD value length <= 8	IG v3.3	7.4.2	Specification	TSPARMCD (the companion to TSPARM) is limited to 8 characters and does not have special character restrictions.
CG0257	3.4	1	TDM	TS	TSPARMCD		TSPARMCD value length <= 8	IG v3.4	7.4.2	Specification	TSPARMCD (the companion to TSPARM) is limited to 8 characters and does not have special character restrictions.
CG0521	3.3	1	SPC	DM	ARM	ARMCD = null	ARM = null	IG v3.3	5.2	Assumption 4	If ARMCD is null, then ARM must be null and ARMNRS must be populated with the reason ARMCD is null.
CG0521	3.4	1	SPC	DM	ARM	ARMCD = null	ARM = null	IG v3.4	5.2	Assumption 4	If ARMCD is null, then ARM must be null and ARMNRS must be populated with the reason ARMCD is null.

Identifier | Scope | Rule logic | Specifications

[SDTM and SDTMIG Conformance Rules v2](#) *Excel Spreadsheet*

TIG Conformance Rules

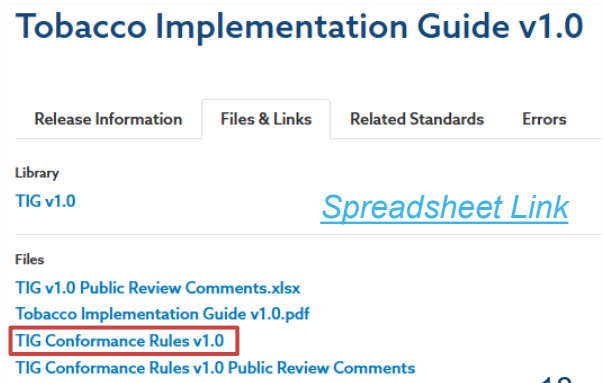
TIG v1.0

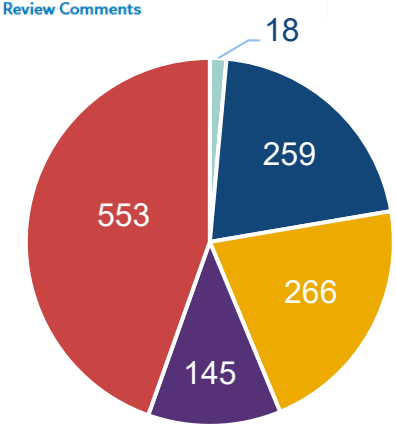
TIG Conformance Rules v1.0

Use Case

- Product Description
- Nonclinical
- Individual Health
- Analysis

1241 rules





Product Description and Individual Health

TIG Conformance Rules - Spreadsheet

Identifiers				Scope of Rule				Statement of Rule			Cited Guidance			
Rule ID	Rule ID Version (represents any change to the rule)	Ancestor Rule(s) from SEND v3.1.1, SDTM v3.4, ADaM v1.3	Rule Set (Generally IG Version, OCCDS v1.0, ADNCA v1.0)	TIG Use Case	Class	Dataset or Domain or Item Group	Variable or Item	Natural Language Rule (Success Criteria)	Rule (Success Criteria)	Condition (Success)	Cited Document	Cited Section	Cited Item (text, figure, table, footnote)	Cited Guidance (start with variable you are referring to if, for example it is from CDISC Notes)
TIG0004	1	NEW	TIG v1.0	PROD	REF	TO	TOPARMCD, TOVAL	TOVAL must be populated when TOPARMCD = TBPRDCAT	TOVAL ^= null	TOPARMCD=TBPRDCAT	TIG 1.0	2.8.8.1	assumption 2	A minimally meaningful TO dataset must include at least the parameter for tobacco product category (TOPARMCD = TPRDCAT)
TIG0212	1	SEND30	TIG v1.0	NONCLIN	ALL	ALL	GEN	Variable name is in uppercase	Variable name is in uppercase		TIG v1.0	2.6, 2.8.3 (5.c)	Text	Variable names should be represented in uppercase.
TIG0450	1	CG0246	TIG v1.0	INDH	TDM, SPC	TA, TE, SE	ETCD		ETCD value length <= 8		TIG 1.0	2.8.10.27|2.8.10.28	Specification:ECTD	ETCD (the companion to ELEMENT) is limited to 8 characters and does not have special character restrictions. These values should be short for ease of use in programming, but it is not expected that ETCD will need to serve as a variable name.

Identifier | Scope | Rule logic | Specifications

Ancestor Rules

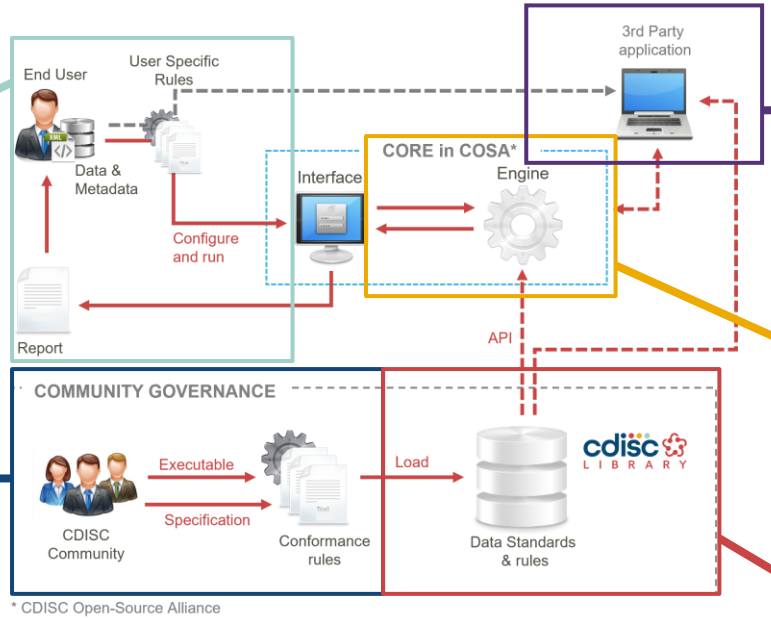
- NEW → TIG v1.0 specific Conformance Rules
- SENDXX → copied from SEND Conformance Rules
- CGXXXX → copied from SDTM and SDTMIG Conformance Rules

Building the CDISC Open Rules

Translating TIG Logic into Machine-Readable, Executable Rules

Building the CDISC Open Rules

Review of validation output including company defined custom rules



Development of validation applications by third party vendors

Rules Engine retrieves Conformance Rules and validates data

Published Conformance Rules stored in CDISC library

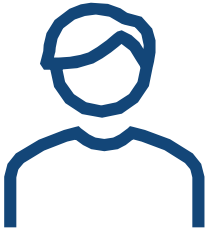
Define and create machine executable Conformance Rules in Rule Editor

@CDISC 2025

Building the CDISC Open Rules

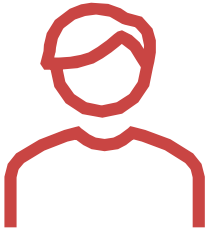
Expectations vs. Reality

"Transforming TIG Conformance Rules into CDISC Open Rules - how hard can it be?"



"Hmmm, not so fast! Have you taken following into consideration?"

"Piece of cake!" "I can do it with my eyes closed."



1. Are Condition and Rule Really Clear?

Example: TIG0513

WHEN

--STAT = null or --DRVFL ^= 'Y'

THEN

--ORRES ^= null

1:1 translation

```yaml
Check:
  all:
    - name: --STAT
      operator: empty
    - name: --DRVFL
      operator: not_equal_to
      value: 'Y'
    - name: --ORRES
      operator: empty
```

Meaning of '= null' (perm var)?

→ Present but no value?

→ Not present **or** present but no value?

Meaning of '^= Y' (perm var)?

→ Not equal to 'Y'?

→ Not present **or** not equal to 'Y'?

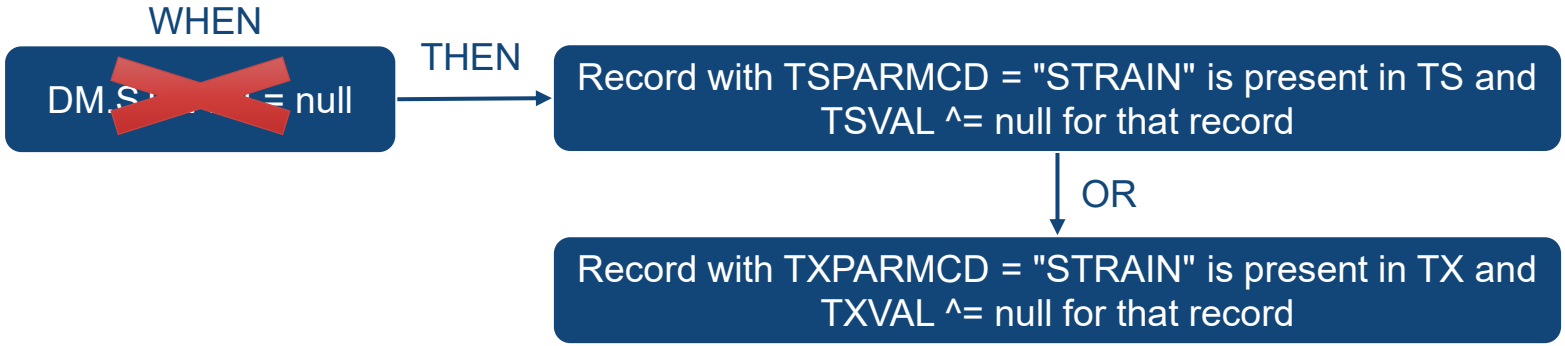
After in depth analysis of the rule

```yaml
Check:
  any:
    - all:
        - name: --STAT
          operator: empty
        - name: --DRVFL
          operator: not_equal_to
          value: 'Y'
          value_is_literal: true
        - name: --ORRES
          operator: empty
    - all:
        - name: --STAT
          operator: empty
        - name: --DRVFL
          operator: not_exists
        - name: --ORRES
          operator: empty
    - all:
        - name: --STAT
          operator: not_exists
        - name: --DRVFL
          operator: not_equal_to
          value: 'Y'
          value_is_literal: true
        - name: --ORRES
          operator: empty
```

2. Does Direct Copying from Ancestor Rule Work?

Example: TIG0044

Ancestor rule SEND106.1



Number of *in vitro* studies for Tobacco is increasing

→ No DM domain

→ Condition DM.STRAIN = null is not relevant in this case

→ Update TIG0044 to include 2 situations: 1) with condition *(in vivo)*, 2) without the condition *(in vitro)*

3. Is 1 Conformance Rule Really 1 CDISC Open Rule?

Example: TIG0310

WHEN

Variable is not TS.TSSEQ

THEN

--SEQ is a unique number per one of the following identifier variables, per domain: USUBJID, SPTOBID, POOLID, SPDEVID, or G[illegible]ID

Define a NONCLIN version

Programmatically the rule was to split into 5 CDISC Open Rules!

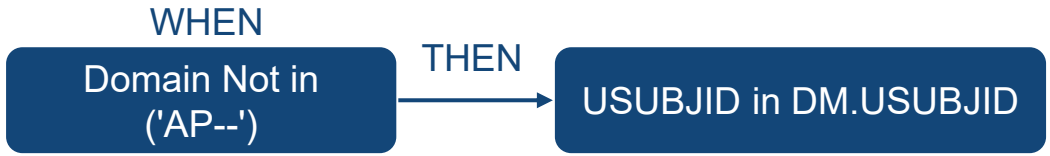
SCOPE - INCLUDE	SCOPE - EXCLUDE	APPLICABLE VARIABLES
INDH - ALL	TS, EM, DU, DO, DI	USUBJID & POOLID
INDH - DU, DI, DO	/	SPDEVID, USUBJID & POOLID
INDH - EM	/	SPTOBID
PROD - ALL	ES	SPTOBID
PROD - ES	/	STOCONID

4. Can We Combine Rules from Different IGs?

Example:

TIG0046/SEND109

TIG0311/CG0029



Rule descriptions look different but…

→ USUBJID completed = condition, USUBJID not exists → rule skip = ok

→ 'Not in AP--', AP can be excluded from scope = no influence on SEND rule

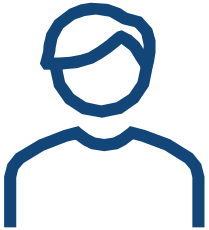
→ 4 rules combined in 1 CDISC Open Rule = efficiency and uniformity

→ Room for description alignment in next versions of spreadsheets

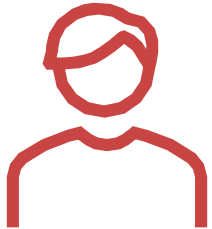
Building the CDISC Open Rules

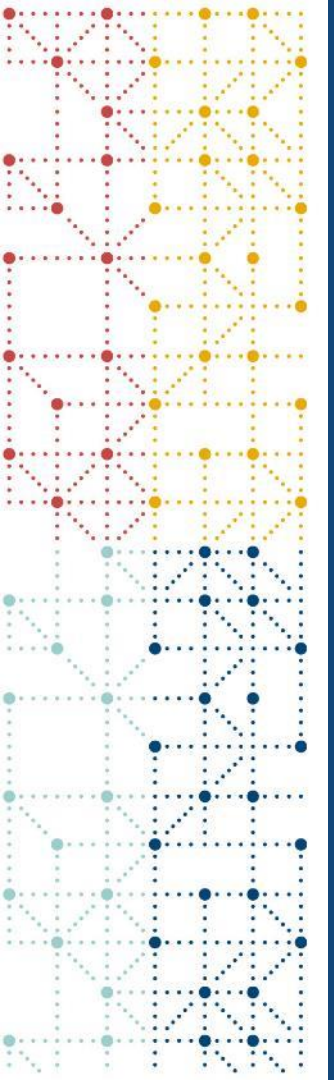
Reflection… ☺

"We thought we were just writing CDISC Open Rules…"



"But soon we were debating whether a variable really exists if no one uses it."





Looking Ahead

Efficiency Grows with Every Lesson Learned

Lessons Learned

One Source of Truth Matters

- CDISC Open Rules centralizes and clarifies rule definitions
- It ensures consistency, traceability, and alignment not only across different implementation guides (IGs) but also across the entire industry

Clarity is Crucial

- Defining a conformance rule without programming it, is challenging
- Ambiguities can lead to misinterpretation
  - → Define rules as clearly and simply as possible
  - → Avoid assumptions - everything must be explicit

Lessons Learned

Programming Reveals Hidden Issues

- Programming TIG rules forced us to re-examine existing rules
- Familiarity with SDTMIG sometimes leads to blind spots - what seemed obvious didn't always translate well to TIG

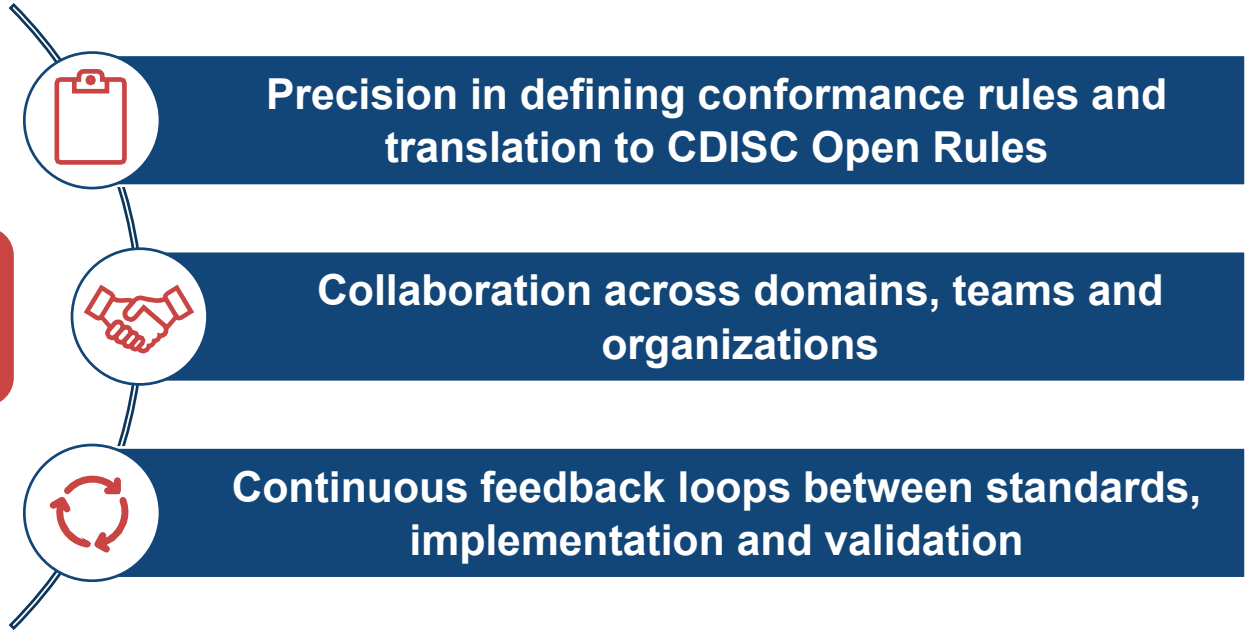
Harmonization Challenges

- Aligning TIG with CDISC Open Rules required thorough review and collaboration
- Revealed overlapping rules, highlighting opportunities for further harmonization between different IGs

Conclusion

The TIG v1.0 Submission Pilot has been a transformative learning experience with regards to Conformance Rules.

Highlighted the importance of



Thank You!

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