About the DMSC



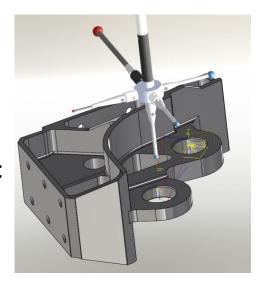
- Who is the DMSC?
 - A group of metrologists, software developers, and innovators worldwide
- What is the DMSC doing?
 - Defining quality measurement information exchange standards like the QIF and DMIS
- How will DMSC membership benefit your company?
 - The DMSC is working on important manufacturing, quality, and measurement standards besides DMIS
 - Member companies have an equal voice in the definition and direction of each standard
 - Membership ensures worldwide implementation of the standards, which is critical to realizing cost savings





Digital Metrology Standards Consortium

- A **non profit**, cooperative sponsorship, **consortium** organization. Founded & sponsored in 1983; Separate legal entity 2005
- Dedicated to identifying, promoting, fostering, and encouraging the **development** and **interoperability** of standards that benefit the digital metrology community
- Preparing standards that impact digital model-based quality enterprise
- A professional group of manufacturing metrologists, software developers, and innovators worldwide. Note: 500+ years of experience contributed to the QIF
- Maintainers of <u>Dimensional Measuring Interface Standard</u> (DMIS) standard
- Developers & maintainers of <u>Quality Information Framework</u> (QIF) standard
- ANSI accredited standards making organization
- A-Liaison member of ISO / TC 184 / SC 4









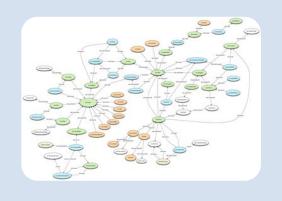
- To reduce the cost of quality
- To enable trusted digital information
- To impact digital metrology within a MBE
- To gain the freedom to choose best in class / best in value solutions



What is the QIF?

ISO 23952-2020











Feature-Based Ontology of Manufacturing Quality Metadata

XML Technology: Simple **Implementation** and Built-In **Code Validation**

Information Semantically Linked to Model for Full Data Traceability to MBD

Approved ANSI Interoperability Standard

Harvesting by ISO / TC 184/SC 4 as ISO/QIF

(Structured Data) (Modern Approach) (Connected Data)

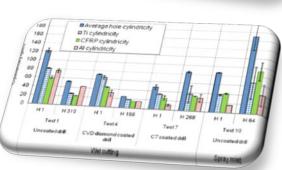
(Standard Data)

The QIF Standard



- Quality Information Framework (QIF): IS O 23952-2020
- An Integrated Model for Manufacturing Quality Information
- Defines, Constrains, and Exchanges:
 - Model-Based Definition
 - Feature-Based (Metrology/Measurement)
 - Semantic PMI (Characteristics)
 - Quality Planning
 - Whats: Bill of Characteristics (BoC)
 - Hows: Inspection Plan
 - Measurement Execution
 - DMIS 5.3 w/QPIds
 - Measurement Results
 - Piece Part
 - Statistical
 - Enterprise Connectivity for Quality Feedback
 - Quality Persistent ID (QPId) (i.e., Universal Unique ID (UUID))
 - 651aded1-ff04-498a-968e-044147a2506d







QPIds – Persistent UUID within the QIF



QIF Persistent Identifier (QPId) noun Cu-pid \'kyü-pəd\



- Universally Unique Identifier (UUID) (adopted by Microsoft as GUID)
 - ISO/IEC 9834-8
 - 550e8400-e29b-41d4-a716-446655440000
- Chances of generating two that are the same within the universe are practically nil.
- Allows information to be combined later without resolving identifier conflicts
- Many software development libraries generate UUIDs
- QPIds uniquely identify
 - QIF Document
 - QIF Plan
 - QIF Result
 - QIF Rule Set

- Feature Item
- Characteristic Item

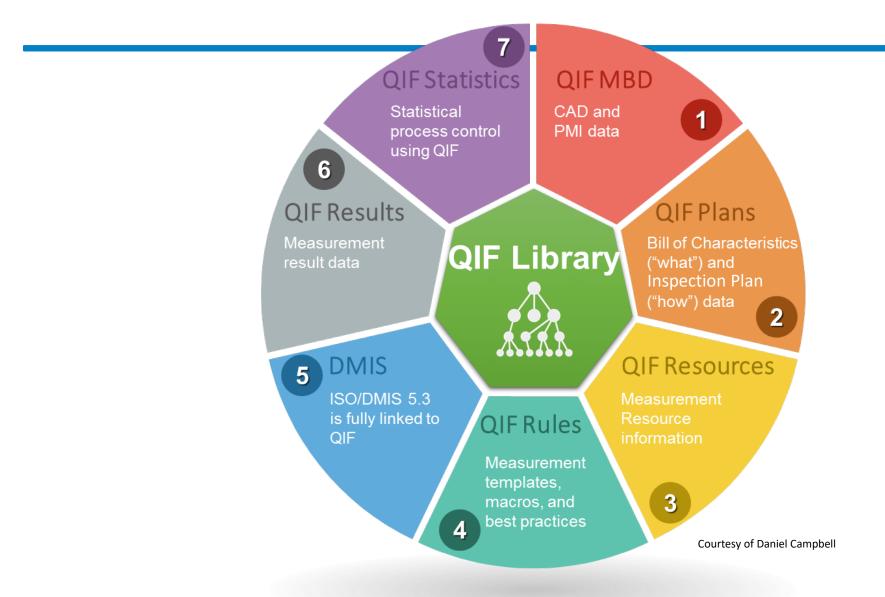


- Product Item
- Resource Item

An Important Mechanism that facilitates Lifecycle Connectivity w/ Traceability

QIF Application Areas



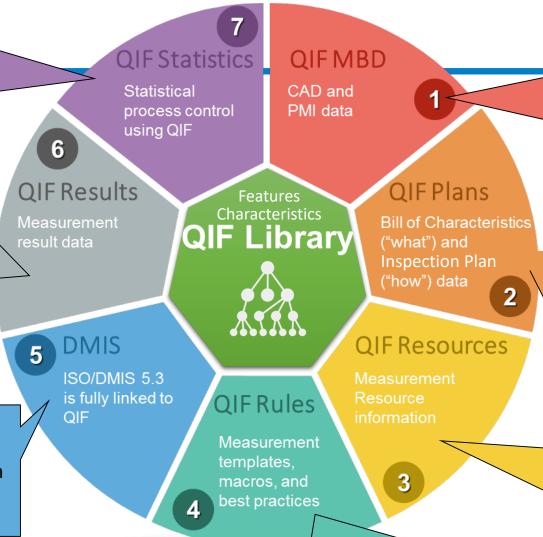


QIF Application Areas

Reference a bundle of QIF
Results sets and specify a
statistical analysis method to be
carried out. Can optionally include
the results of the statistical
analysis as well

Measurement results data, associated with the MBD! This can be just tolerance evaluation results, and can even include all the point cloud data from the features

DMIS is <u>not</u> part of QIF, ISO 22093, however the latest ANSI DMIS 5.3 has been updated to harmonize with the data traceability mechanisms in QIF



Create measurement rule templates. (e.g., *If a Surface Profile tolerance value is less than* **x**, *then use a CMM method with at least* **y** *number of point/sq.in.*)



QIF MBD is the base for providing traceability to authority CAD data. It is not required for basic QIF use cases. Considered to be the strongest semantic CAD+PMI standard available

Wide range of optional levels of detail for measurement plans:

- What to Measure: Bill of Characteristics
- How to Measure: Inspection Plan
- Assign measurement resources
- Specify sampling point locations

Specify basic or highly detailed information about available measurement equipment (e.g., CMMs, probes, calipers, gages). As always, this data is contextual and semantic.

QIF Business Value



Manufacturing Perspective

- Reduce Cost
- More common interfaces
- Freedom of choice in selection of value and performance based metrology solutions.
- Interoperability allows for Best-In-Class / Best-in-Value (hybrid solution)
- Persistent traceability between disciplines and back to the Model
- Quality solutions that communicate inspections results back to design & manufacturing
- Impact quality within a Model-Based Enterprise An official ISO standard: ISO 23952-2020



QIF Business Value



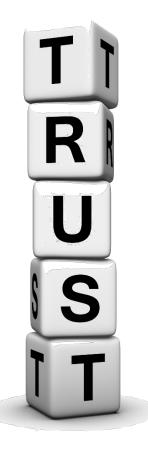
Vendors Perspective

- Reduce Cost
- Concentrate on Core Competency
- Inherent validations for data correctness
- Easy of (XML Schema Based) Implementation
- Cost efficient to implement and use
- Minimize software development
- Avoid non-value (proprietary systems) development
- Complete but **extensible**
- Expanded market opportunities (penetrate proprietary systems)
- An official standard, and if it is a world-wide standard the better

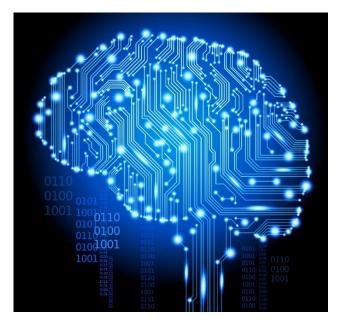


QIF is Digital



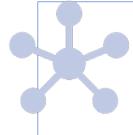


And It can be Trusted to Connect your Enterprise



QIF Roadmap for Success





Active Schema Development



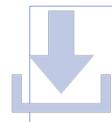
Data Integrity



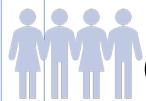
Standardization Efforts



Facilitate Software Development



Free Open Source Tools

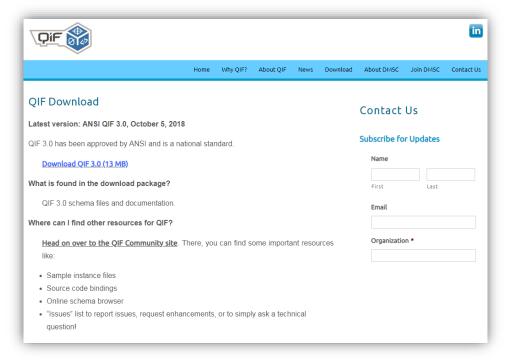


QIF Community

QIF on the Web



- QIFStandards.org
 - QIF Download



QIF Community - GitHub



- QIF Schema Browser
- QIF Sample Instance Files
- Source Code Bindings
- QIF "Issues" List
- QIF Standard Website
- Getting Started Video

The online hub for the QIF community



QIF3 Schema Browser

Are you busy writing support for the QIF format? Here is an online location where you can browse the contents of the QIF schemas. It's easy to use!

QIF3 Sample Instance Files

Here are a set of sample QIF3 files. These should help to give you an idea of all the different ways that QIF can help support your enterprise!



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Source Code Bindings

Here, you will find bindings to help you automatically generate source code to start reading and writing QIF files in C++, C# and Python. You'll be surprised how easy it is to start oushing some QIF code.

QIF3 "Issues" Lis

This is for more than just flagging issues with the QIF standard. Here is where you can interact with the rest of the community: ask questions about your implementation, submit enhancements requests, and ask general questions about QIF.





QIF Standard Website The main QIF website. This is

where you can download the standard, including the schemas and the documentation. It's free, go and get it!

Here is a presentation which can show just how easy it is to get started with QIF!



Take Action!







Spread QIF



Join the DMSC

Visit us at: www.qifstandards.org



Download QIF

Why Join the DMSC?





- 1. Your membership directly supports QIF adoption
- 2. Contribute to data interoperability
- 3. Network Be part of the digital movement

Encourage your favorite
CAD Software vendor
to support QIF

Visit www.qifstandards.org for more information.