Challenges!

Get the right Tools!
DMIS Application Profiles & Conformance Testing

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DMIS

Dimensional Measuring Interface Standard
Pre-DMIS Environment

CAD A

Manual Programming

Auto Programming

DME I

DME II

DME III

DME IV

CAD B

CAD w/ Analysis

Quality Information System

Analysis System
DMIS Environment

Manual Programming

DMIS Auto Programming

Quality Information System

DMIS

DME II

DME III
DMIS Timeline & Milestones

- 1985: DMIS 1.0
- 1987: DMIS 2.0
- 1988: DMIS 2.1
- 1990: ANSI Standard
- 1992: TAG Established
- 1993: DNSC Established
- 1995: ANSI Std. Revision
- 2000: DMIS 4.0 Dev.
- 2001: Quality Expo Demo & Release
- Part I Approved for Std. Pub. Review
- ANSI Std. Revision
- Sponsored By CAM-I Program
- Objects
- Quality Expo Updates
DNSC Recognized:

- The Difficulty of Using Past DMIS CHFiles for Evaluating Conformity.
- The Necessity of Guaranteed Interoperability between DMIS Systems.
- That Most DMIS Applications do not Need to Implement the Entire Standard.
- A Need to Define a DMIS Validation Mechanism.
DMIS 4.0:

• Rewrote the DMIS CHFile using the Extended Bakus Naur Format (EBNF)
• Identified Conformance Testing Services
  – To Validate CHFiles
  – To Test Conformance
• Defined an Approach to Insure DMIS Conformity within a DMIS Functional Subset.
DMIS Application Profiles

- Required for DMIS Conformance Testing
- Used to Defines Functional Subsets
- Contains Conformance Levels
  - Level 1: Essential
  - Level 2: Important
  - Level 3: Beneficial
- Must be Formulated, Agreed, and Submitted
- Formally Recognized by DNSC
- Currently none have been Formally Recognized or Submitted
Application Profile Representation

• Currently no Templates have been Defined.
• Define using DMIS 4.0 CHFile EBNF for Easier Comparisons with System’s CHFile.
• Designate Conformance Levels within the Application Profile EBNFs.
Conformance Testing Service

• Can be Provided any Organization.
• Service to be Recognized by the DNSC.
• Develops Test Suites to:
  – Validate CHFile
  – Test DMIS Implementations for Conformity to One or More Application Profiles.
• Currently, No Conformance Testing Service Exist.
DMIS Conformance Testing

• Verify syntax of DMIS input and output files
• Verify that a generator produces conforming metafiles which accurately and correctly represent the intended results
• Verify that an interpreter can correctly and completely read conforming metafiles and produce intended results
• Verify that the DMIS characterization file is syntactically correct and that it accurately represents the capabilities of the application
• Conforming implementation must adhere to prescribed syntax and semantics
Conformance Claim

- OurProduct, Version x.y from DMISVendor conforms to DMIS Application Profile ABC, Level 2 and XYZ, Level 3.
Application Profile Development

• Proposed as AIAG Work Request. Steps include:
  – Discuss common user needs and decide on an application area for which to develop an application profile (e.g., prismatic, sheet metal, etc.)
  – Identify and agree upon the subset of DMIS functionality needed to meet the requirements (define the application profile)
  – Engage vendors and get their input on the application profile (reasonableness, implementation issues, how it fits with their plans etc.)
  – Encourage implementation of the application profile
  – Develop conformance test tools and suites to evaluate conformance of implementations to the application profile (NIST lead)
  – Conduct testing pilot of application profile implementations, using Metrology Testbed equipment and software at industry, NIST, and university sites
Proposed DMIS Testing Architecture

Information model of DMIS

Format Rules

Syntax Check

Parser

Simulation Tool

Structure and Rule check

Inspection Planning Application

Data in Specified Format

Inspection Requirements

Part Description

Machine Description

Probe Description
Seeking Participation

• User representatives who know DMIS well
• Vendors
• Universities, NIST