

ISO/IEEE 11073, HL7 Medical Devices WG and NIST

NIST Medical Device Connectivity Test Tooling Semantic Interoperability of Medical Devices





Topics

- RTMMS
- TCAMT Test Case Authoring and Management Tool
- ICSGenerator





RTMMS

National Institute of Standards and Technology

January, 2012







RTMMS Overview

- RTMMS was developed to support the IHE-PCD Rosetta Terminology Mapping (RTM)
 - Is a web application that allows vendors and reviewers to access and report on Rosetta Tables over the internet in conformance to IHE RTM Profiles.
 - Aids in the harmonization process by identifying missing terms, generate automatically "Harmonized Rosetta Table", view and download latest hRTM table.
 - Facilitates the proposal of new terms to x73 Nomenclature.





RTMMS Users

- General User (All users even without account)
 - Views Rosetta tables
- Vendor
 - Modifies Vendor Rosetta Table, suggests new or mapped terms
- Reviewer
 - Participates in discussions
- SDO (Standard Development Organization)
 - Modifies Units and Enumerations table, register new or mapped terms
- Admin
 - Manages User Accounts





RTMMS: Status Update

(since September 2011 meeting)

- Added aECG into X73 Nomenclature Dbase.
- Populated X73 Nomenclature dbase systematic name, common term, acronym and term description tables.
- Updated hRTM table to include "Vendor_VMD", and "Vendor Description"
- Improved search capabilities
- Added scroll bars in history panel
- Added missing columns in review panels
- Enhanced SDO approval
- Improved import functionality
- Updated password policy
- SDO ability to view previous Rosetta versions.
- View/Manage X73 terms
- Tool ready for initial release end of January
 - Limited accessibility to selected user





RTMMS Scenarios

- Scenario 1: Mapping a term to the X73 Nomenclature
 - Vendor successfully maps a term to X73 nomenclature.
 - Outcome: The mapped term is added to the Rosetta table.
 - The SDO reviews and approves the proposed mapped term.
 - Outcome: The hRTM is updated, not updates to the X73 Nomenclature.
- Scenario 2: Missing Terms in the X73 Nomenclature
 - Vendor finds a missing term in the X73 and proposes a new term
 - Outcome: The Rosetta table is updated with new proposed term.
 - SDO reviews and approves the new proposed term.
 - Outcome: The hRTM and X73 tables are updated and the term remains in Rosetta, but shows as an already reviewed and approved term (is not highlighted).





RTMMS: Scenario 1 DEMO

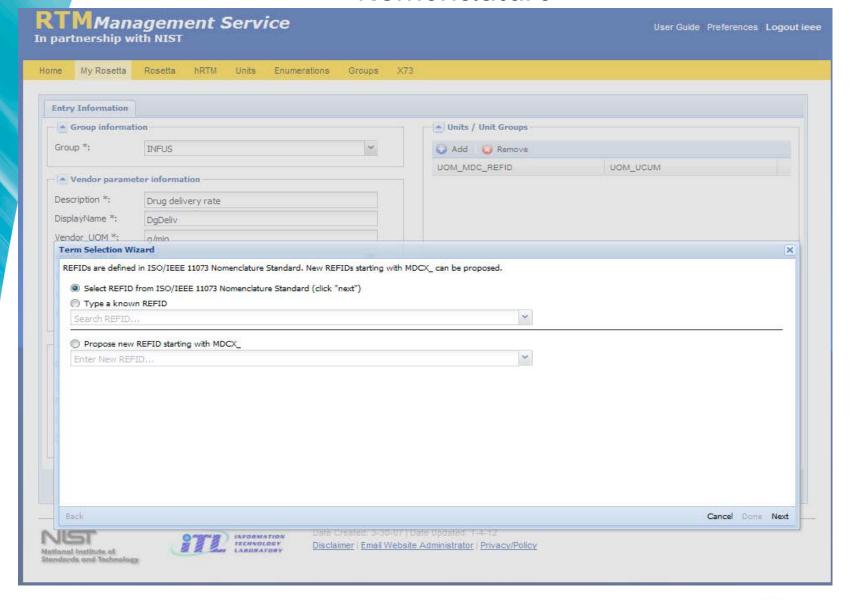
- Scenario 1: Vendor successfully maps a term to X73 nomenclature.
 - Description = "Drug delivery rate"
 - DisplayName = "DgDeliv"
 - Vendor_UOM = "g/min"
 - Vendor_Status = "DN"
 - Vendor_Sort = "8"
 - Vendor_VMD = "MDC_DEV_PUMP_INFUS_VMD"







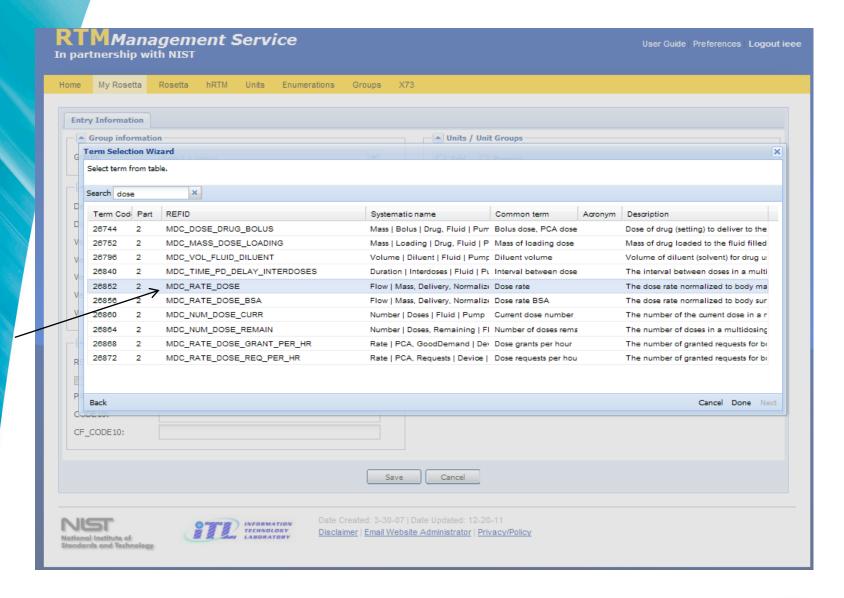
Vendor initiates mapping by searching the X73 Nomenclature







Vendor finds a mapping









Vendor reviews mapped term

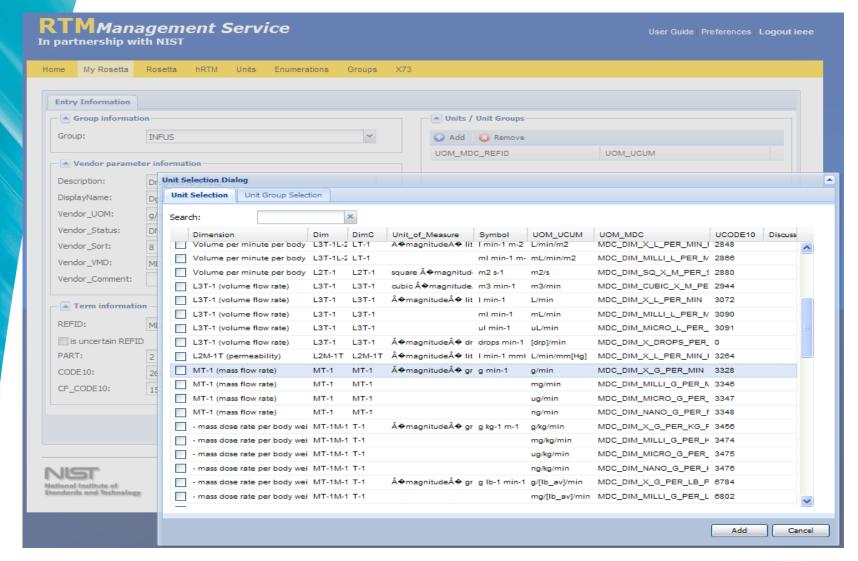
me	My Rosetta	Rosetta	hRTM	Units	Enumerations	Groups	X73	
Entry	Information							
<u>▲</u> G	roup informati	ion —						■ Units / Unit Groups
Group):	INFUS				~		
								UOM_MDC_REFID UOM_UCUM
	endor parame							
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	or_UOM:	g/min						
	or_Status:	DN				~		Enumerations / Enumeration Groups
Vendo	or_Sort:	8 MDC_DEV_PUMP_INFUS_VMD						
Vendo	or_VMD:							
Vendo	or_Comment:							Enum_Value
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Vendor select a unit (g/min) for the term

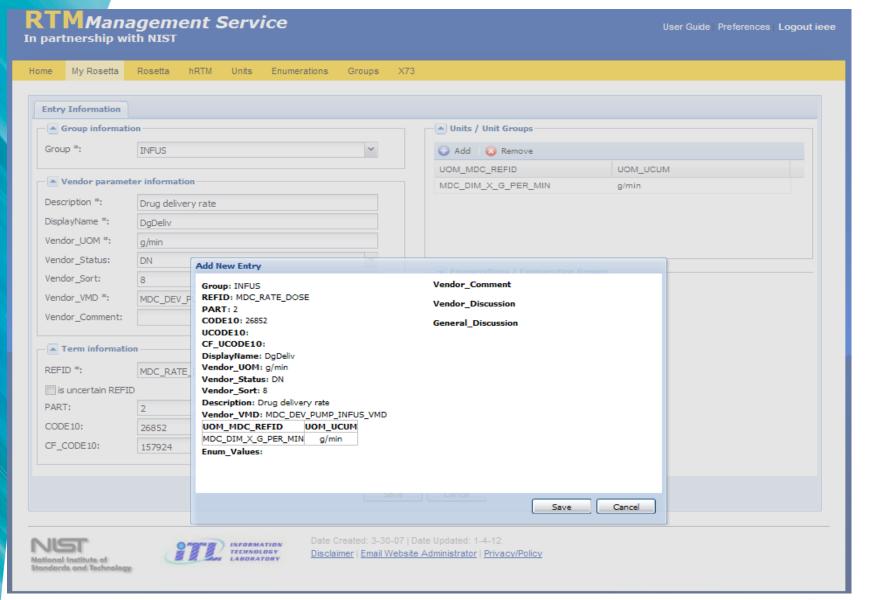








Vendor review and save mapped term

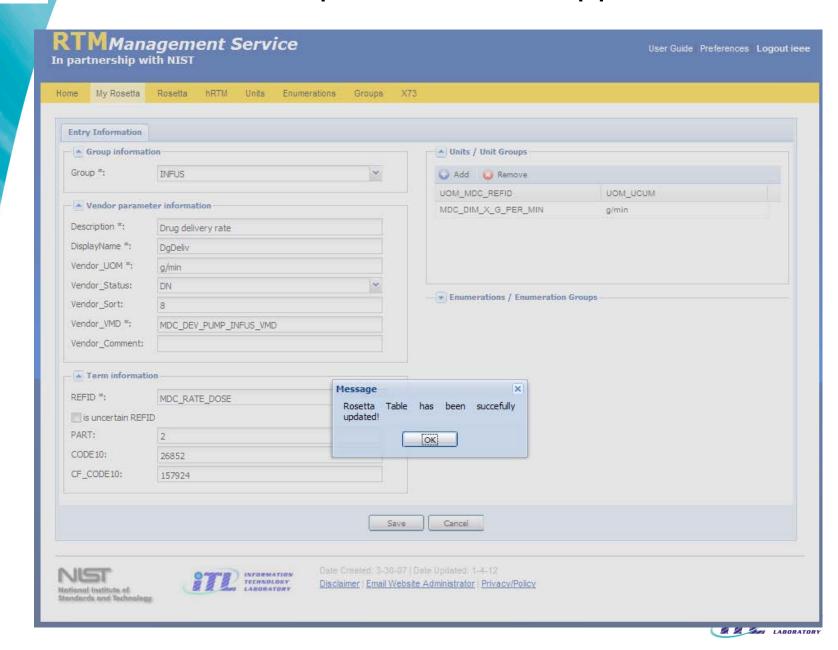






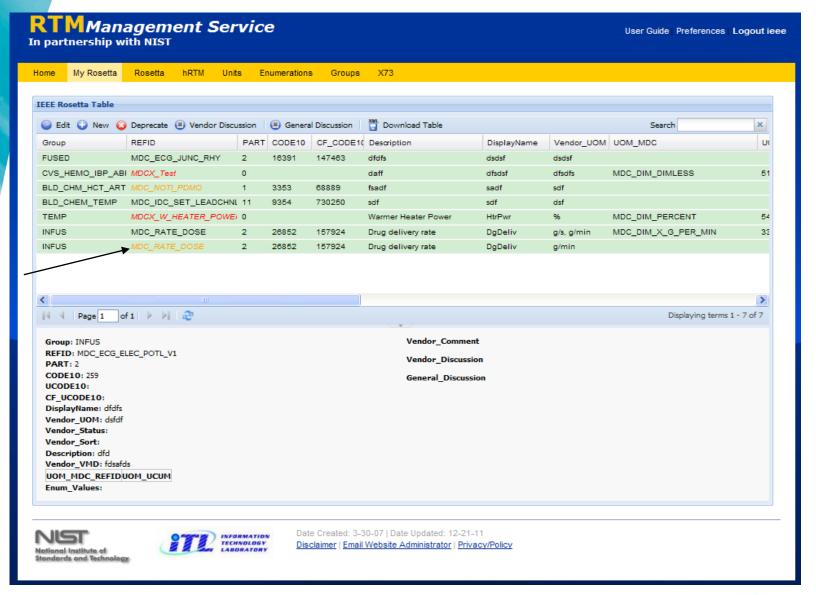


Rosetta is updated with mapped term





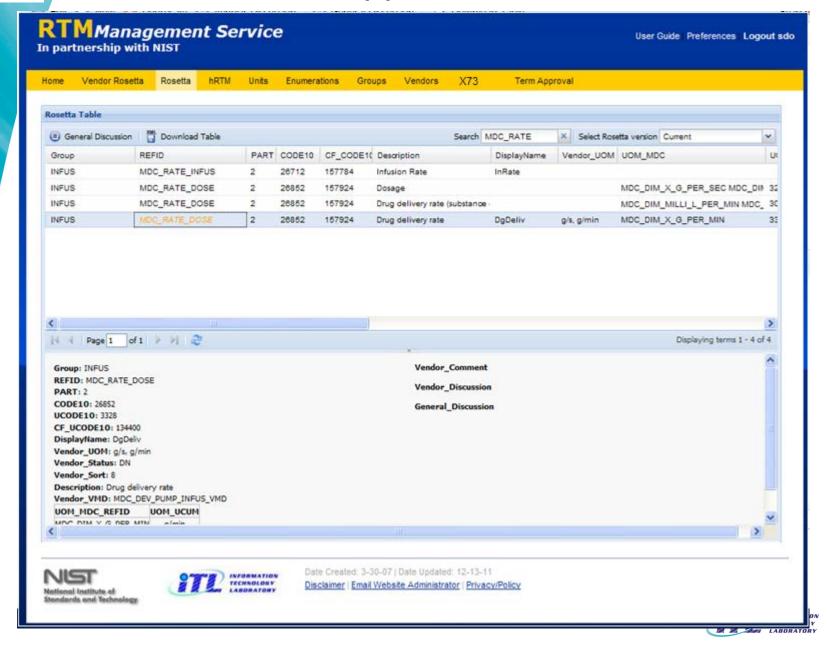
Mapped term is now in Vendor Rosetta





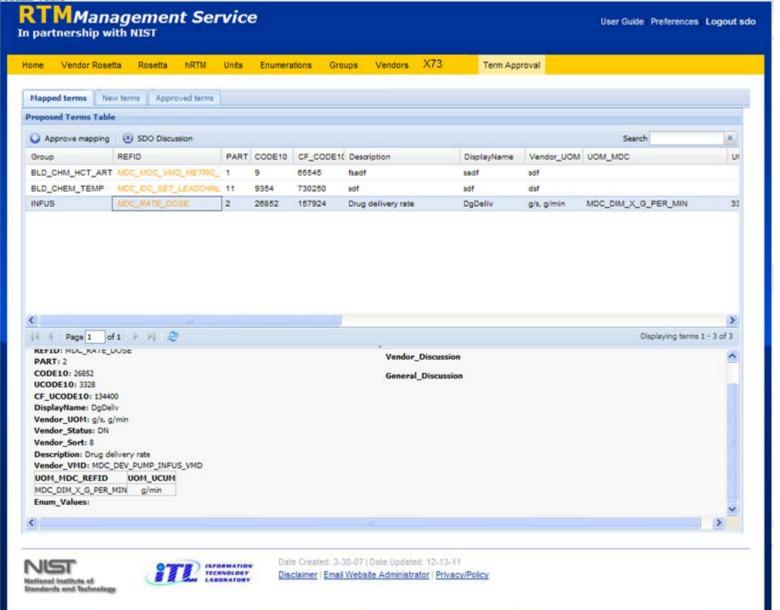


SDO lists mapped term in Rosetta

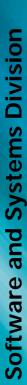




SDO reviews term for approval

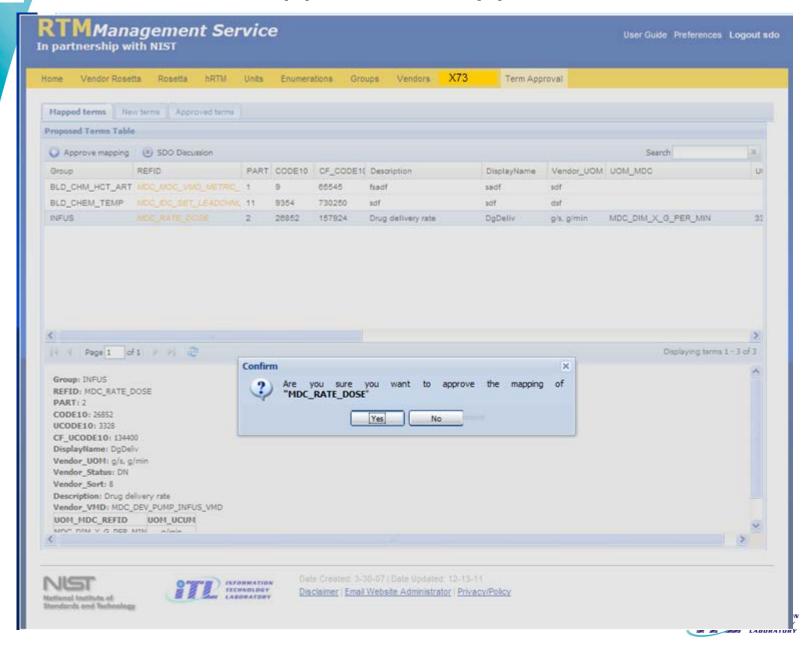








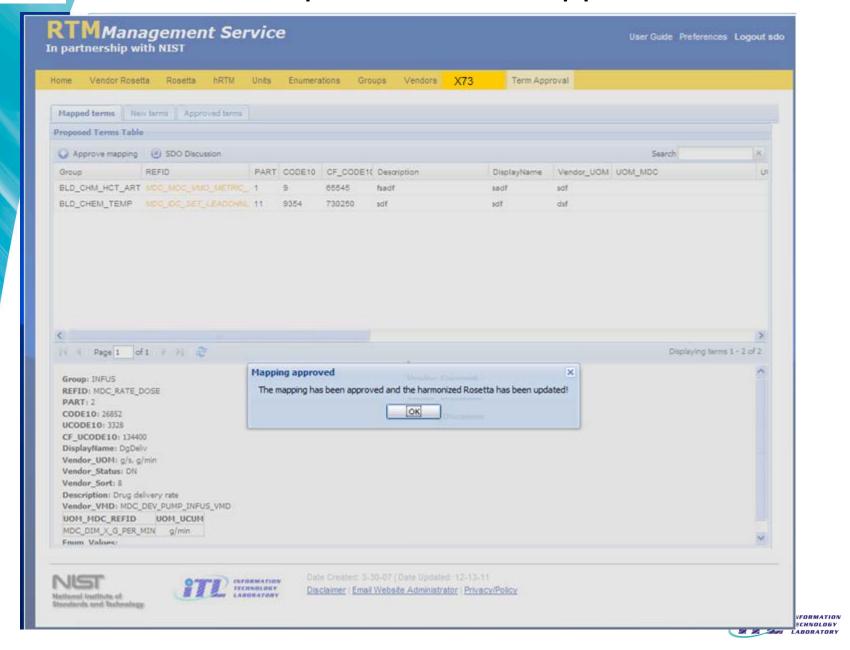
SDO approves mapped term

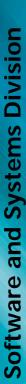






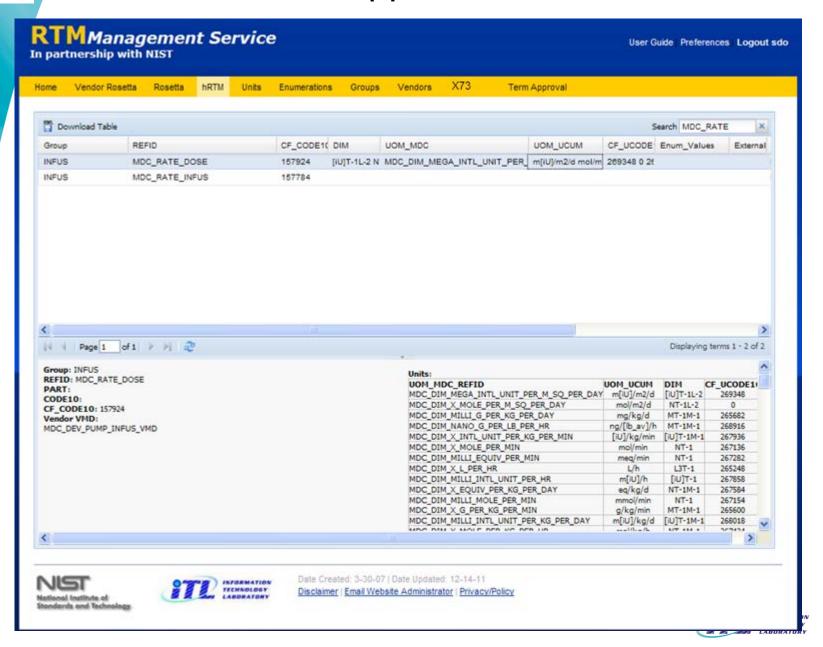
hRTM updated with mapped term







SOD lists mapped term in hRTM





RTMMS: Scenario 2 DEMO

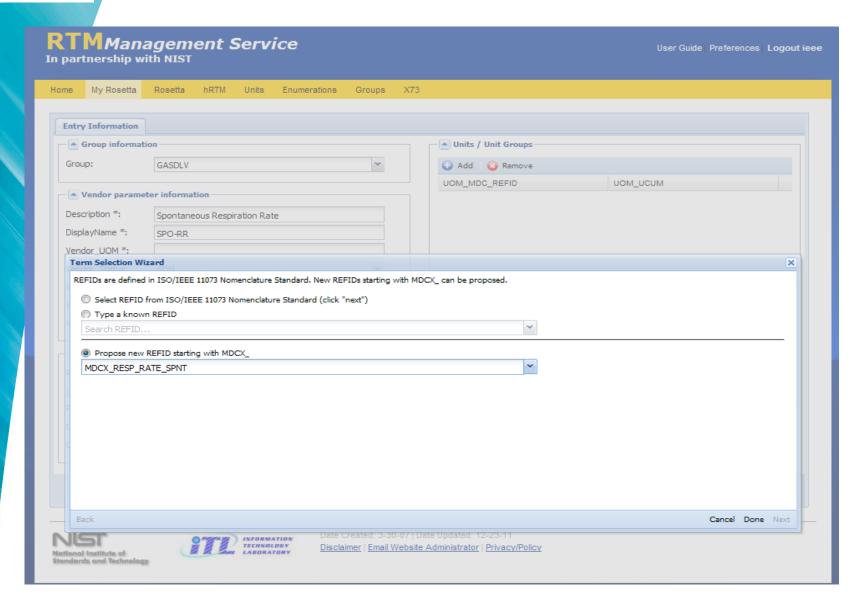
- Scenario 2: Vendor IEEE proposes a new term to the X73 nomenclature, mapping was not possible.
 - Group: GASDLV
 - DisplayName: SPO-RR
 - Vendor_UOM: breaths/min
 - Vendor_Status: GDN
 - Vendor_Sort: 23
 - Description: Spontaneous Respiration Rate
 - Vendor_VMD: MDC_DEV_ANALY_AWAY_MULTI_PARAM_VMD







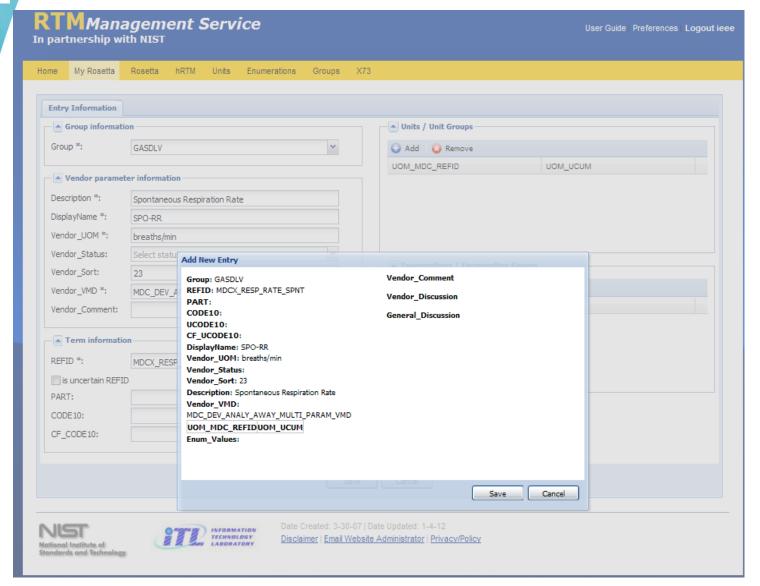
Vendor proposes a new term







Vendor review and save term info

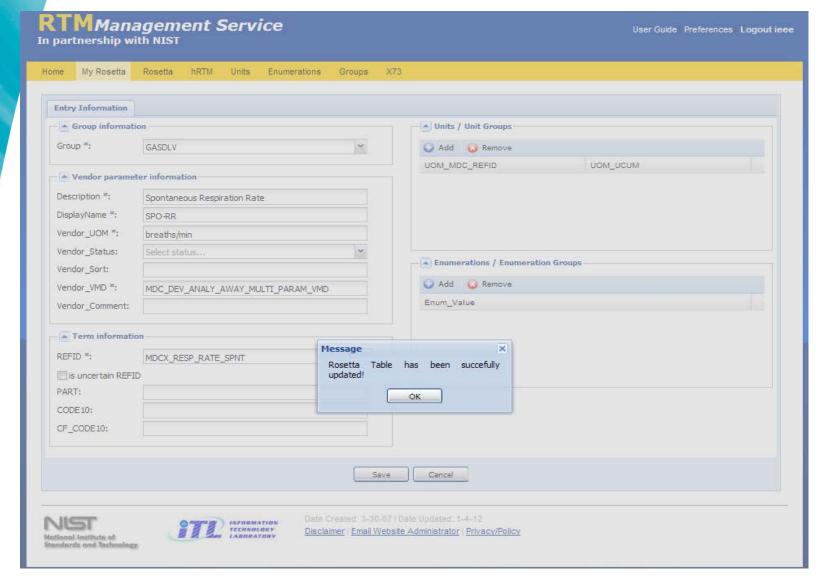








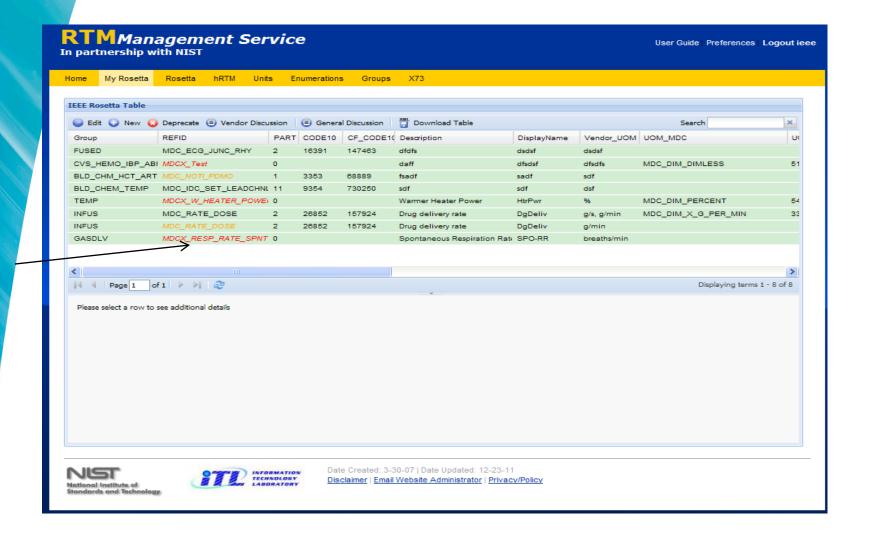
Rosetta table is updated with new proposed term







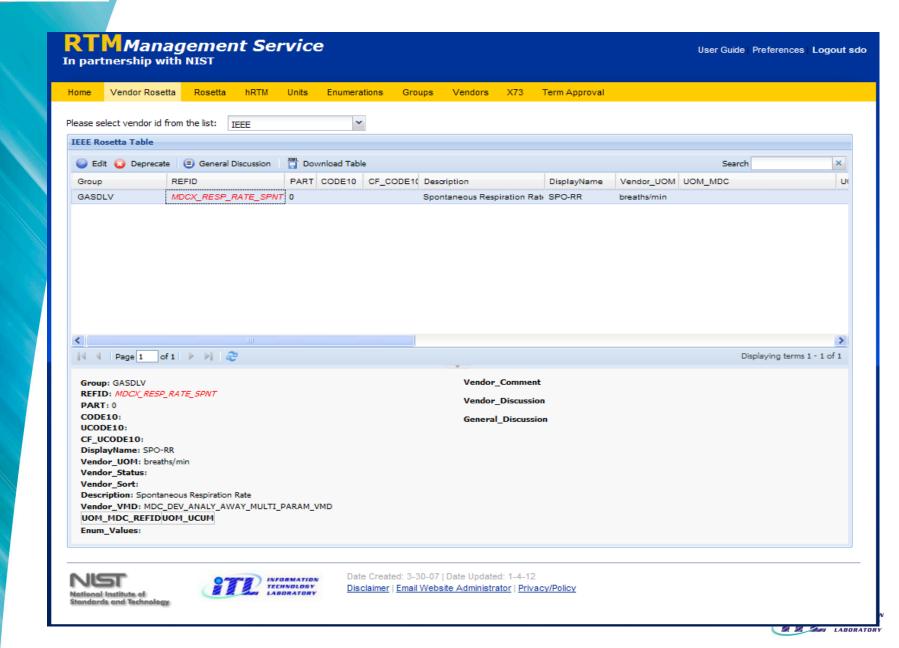
New Term added to Rosetta







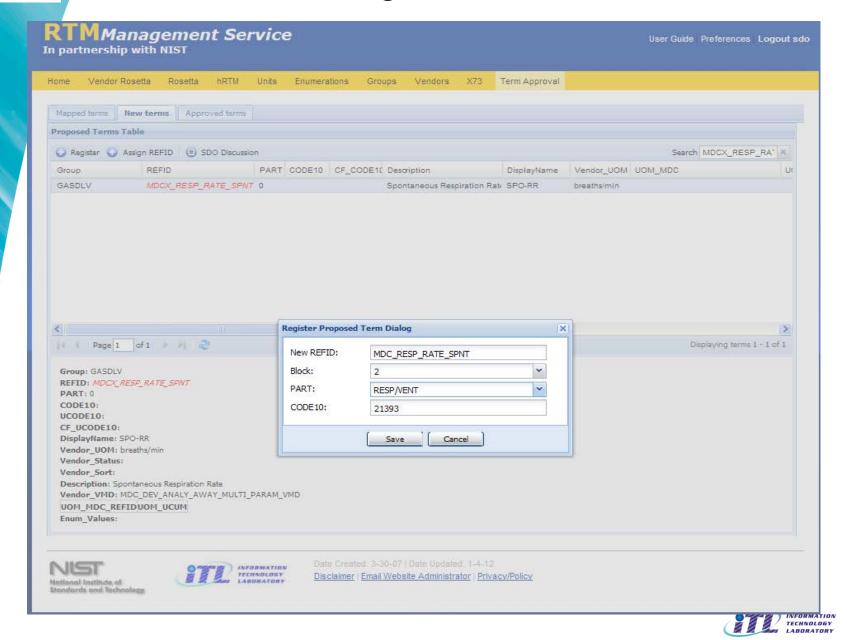
SDO Review new proposed term







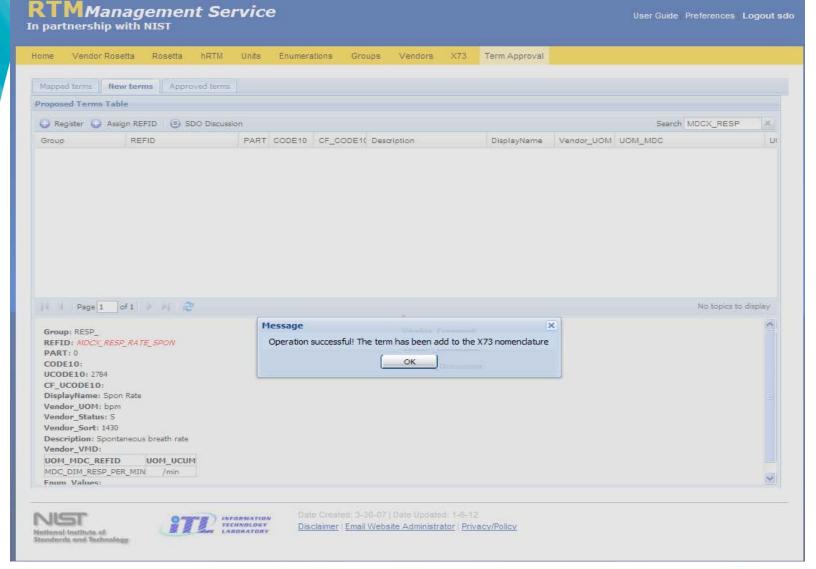
SDO register new term







X73 Nomenclature is updated with new term







Next Steps

John add release info!!





Issues

- IEEE copyright issues
 - Against NIST Policy to maintain proprietary data
- Integration of LOINC Terms
 - We have no documentation on LOINC.
 - Mapping must be provided.
- Waiting for SNOMED mapped terms.





Test Case Authoring and Management Tool (TCAMT)

National Institute of Standards and Technology

January , 2012





Test Case Authoring and Management Tool Overview

- Constructs Test Case Library for authoring the Test Cases
 - Test Artifacts: Actor, Message, Interaction, and Transaction
 - Embedded Assertion Generator: Message level, Interaction level, and Transaction level Assertions
 - Imports additional Test Artifact: Conformance Profile and Table Library
- Build Test Suite
 - Creates test plan, test cases, test steps
- Creates executable files
 - Generation context, Validation context
 - Test Engine script
- Generates English Document Test Plan
- Web Application and Graphical User interface





Test Artifacts definitions

Message

 A message is an object of communication. Conceptually, it is a kind of event, not actual (real) message between real actor. It may indicate its schema such as XML schema, conformance profile in order to define its syntax and structure.

Interaction

 An interaction represents to transfer information (message) between two or more actors. It generally consists of initiating Actor, message, and responding Actor.

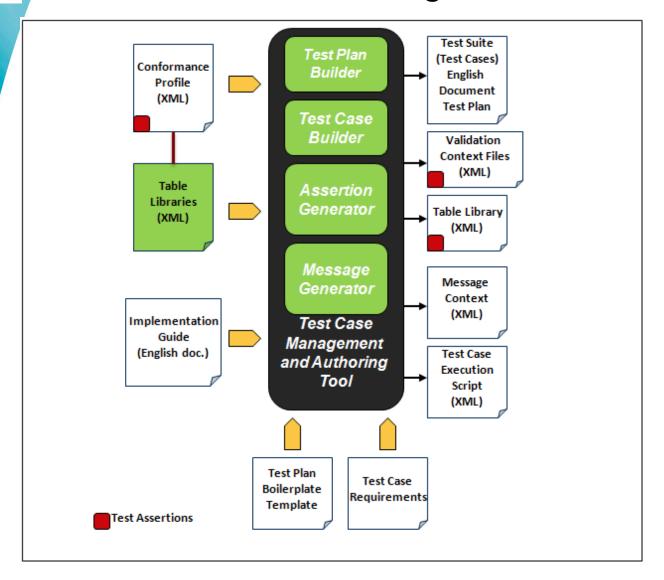
Transaction

- A transaction is a sequence of Interactions between two or more actors, that have a specific business meaning and are supposed to occur together.
- A transaction is a sequence of one or more interactions that have a specific business meaning and are supposed to occur together.





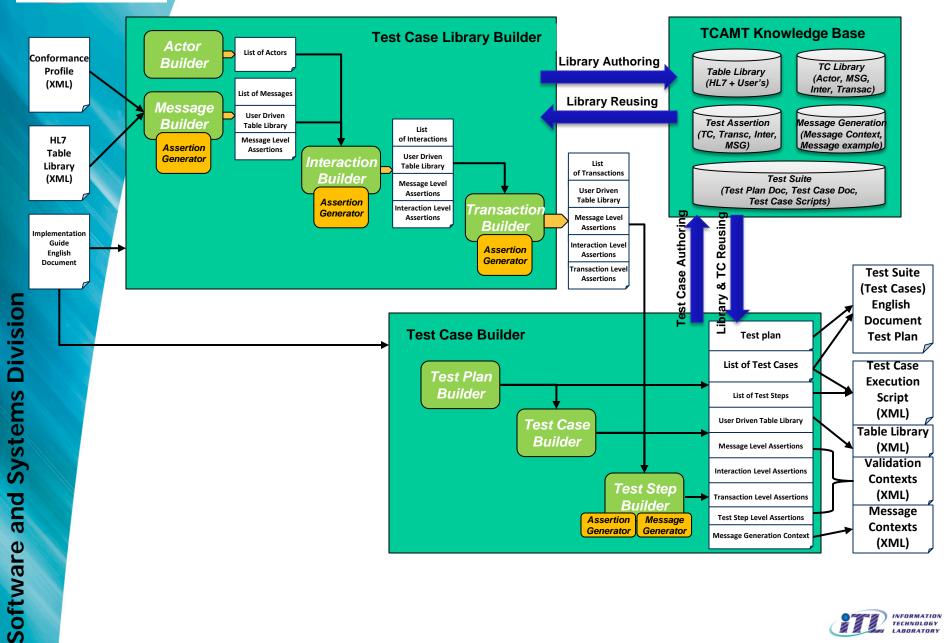
TCAMT High Level







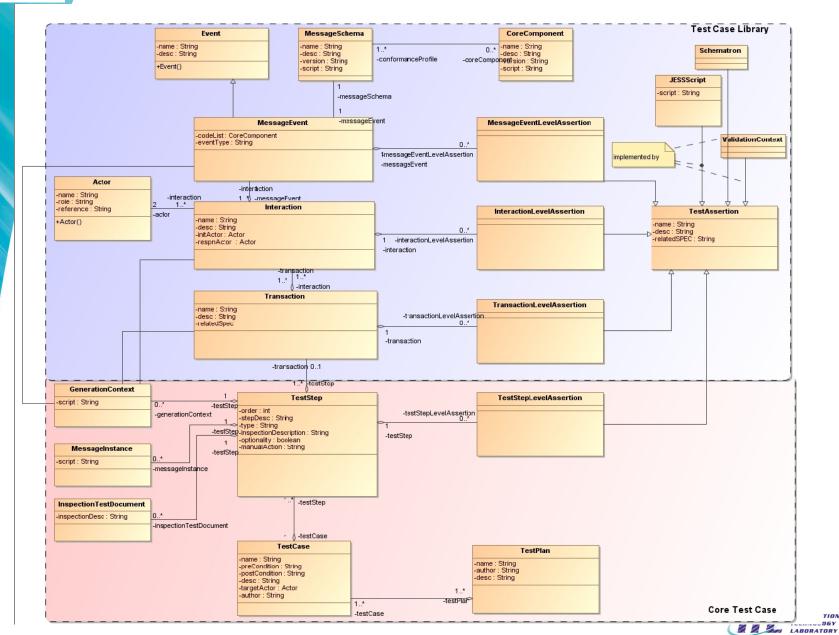
TCAMT







TCAMT Model





TCAMT Status

- Developed Functional specification for the TCAMT-Assertion generator.
- Developed TCAMT-Assertion Generator User Requirement document.
- User interface design/ wireframes
- TCAMT initial prototype developed
- TCAMT Initial testing performed
- Assertion Generator core logic and base UI developed
- Assertion Generator: Tree Table model constructed for Conformance Profile
- Assertion Generator: Data Value Assertion, Conditional Assertion

(Ongoing)

- TCAMT and Assertion Generator: User, version, life-cycle manager
- Assertion Generator: Correlation Assertion
- TCAMT: Test Plan Manager and view
- TCAMT: Test Case Manager and view





TCAMT Next Steps

- Release working version for TCAMT and Assertion Generator
- Create Test Plan for PIX-PDQ and IHE-PCD
- Continue TCAMT development and enhancements
- Demo/Promote for use in other domains
 - IHE, MU, etc.
- Journal Paper for Test Case Generation

