



15th Annual International Open Forum on Metadata 2012

“Cooperation and Interoperation”

ISO/IEC 11179 Metadata Registries (MDR)
& ISO/IEC 19763 Metamodel Framework for Interoperability (MFI)

Denise Warzel, JTC1/SC32/WG2 Convenor

Call for Participation Focus: Demonstrate or Describe Requirements

- + Metadata to support managing the **meaning of enterprise information resources**
- + Using semantics to support data sharing and data discovery
- + Metadata for managing the semantics of **web services, XML data exchanges, data management, open and linked data and other applications.**

```
<raceCategoryText>Asian</raceCategoryText>  
<personGenderTextType>Female</personGenderTextType>  
<ethnicCategoryGroupType>Not Hispanic or  
Latino</ethnicCategoryGroupType>
```



Outline

- + Review Open Forum Agenda
- + ISO/IEC JTC1 WG2 Metadata
 - + Metadata Expanded
- + Relevant WG2 Metadata Standards
 - + Introduction, overview of 11179 and 19763 Metadata Registries and Metamodels

Open Forum Agenda - Industry focus

+ Healthcare

- + Using metadata to pre-fill electronic Case Report forms - *CDISC*
- + 11179 metadata registry for Medical Research Center (MRC) and National Health Service (NHS) in UK – *University of Oxford*
- + 11179 metadata registry for research in Germany - *IBE Ludwig-Maximilians-Universität München*
- + TMF (Technology, Methods, and Infrastructure for Networked Medical Research) on Metadata and Linked Data Forum - *Universität Leipzi*

Open Forum Agenda - Industry focus

+ Geospatial

- + Using 11179 for registration and retrieval of Geopolitical code sets - *U.S. Department of Defense*

+ Telecommunications

- + Metadata requirements for cloud computing - *Telekomunikacja Polska*
- + Semantics of exposed service operations and parameters - *Orange Labs*



JTC1/SC32/WG2 Metadata

Mission: Standards for data management that facilitate specification and management of metadata, metamodels and ontologies to **support interoperability**.

Metadata → “Data about Information Objects”

- + About data, processes, services, ontologies and information models
- + Metadata to manage **semantics for information objects**
 - + **Such as data, information models, processes, web services....**

Working group documents are open and available on the WG2 web site:

<http://metadata-standards.org>



Relevant WG2 Standards

+ **11179 Metadata Registries (MDR)**

- + Registration and metadata management for 11179 and 19763
- + Recording and managing the semantics and representation of **data**
 - + RDBMS, flat files, MS Excel spreadsheets, XML documents, linked and open data
- + 3 talks in Healthcare
- + 1 talk in Geospatial

11179-3 Data Element Registry

Data

“3”

Attributes

identifier:

name:

data element concept:

representation:

datatype:

.....

type:

permitted values:

coded value meaning



11179-3 Data Element Registry

Data

“3”

Attributes

identifier:
name:
data element concept:
representation:
datatype:
....
type:
permitted values:

coded value

- 1
- 2
- 3
- 4

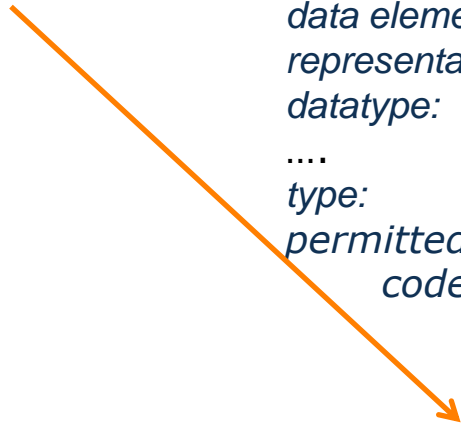
meaning

- Single
- Double
- King
- Suite

Registered Metadata

2674076v2.0
Hotel Room Type Code
Hotel Room Type
Code
Numeric

Enumerated





Relevant WG2 Standards

- + **19763 Metamodel Framework for Interoperability (MFI)**
 - + Managing the semantics and representation of additional information objects to enable effective interoperability and sharing of these resources (core model and mapping)
 - + **Processes, web services, information models and ontologies...**
 - + 2 Talks in Telecommunications

19763-5 Process Model Registry

Process Model “Make Record”

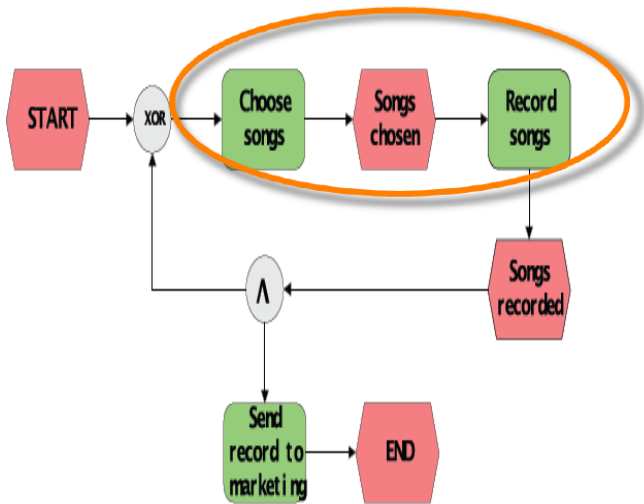


Figure A.3.1 – shows the registration information of MakeRecord

EPC (Event-driven Process Chain)

EPC, BPMN, UML, IDEF0, IDEF3,
PSL, etc

Attributes

Identifier:
name:
type:
partOf:
triggeredBy:
produces:

Identifier:
name:
type:
partOf:
triggeredBy:
produces:

Identifier:
name:
type:
partOf:
triggeredBy:
produces:

Registered Metadata

34909211v1.0
Choose Songs
Process
MakeRecordToSellProcessModel
Event Start
SongsChosen

34909212v1.0
SongsRecorded
Event
MakeRecordToSellProcessModel
Event SongsChosen
SongsRecorded

34909212v1.0
Record Songs
Process
MakeRecordToSellProcessModel
Event SongsChosen
SongsRecorded



19763-7 Service Model Registry

Service Model

WSDL 2.0 Service:

```
...  
<xs:element name="checkAvailability"  
type="tCheckAvailability"/>  
<xs:complexType name="tCheckAvailability">  
<xs:sequence>  
<xs:element name="checkInDate" type="xs:date"/>  
<xs:element name="checkOutDate" type="xs:date"/>  
<xs:element name="roomType" type="xs:string"/>  
</xs:sequence>  
</xs:complexType>  
...
```



WSDL, WSMO, OWL-S, etc

Attributes

Identifier:
name:
domain:
type:
achieves:
composition:
isProvidedBy:

Identifier:
name:
domain:
type:
has_input:

has_output

Registered Metadata

34909214v1.0
Reservation Service
Travel
Task service
Check Availability Goal
Check Availability Operation
Hotel Great H

34909215v1.0
Check Availability Operation
Travel
Service Operation
checkInDate, checkOutDate,
roomType,
roomRate



19763-12 Information Model Registry

Information Model "Robinson Motor Vehicle Service Recording"

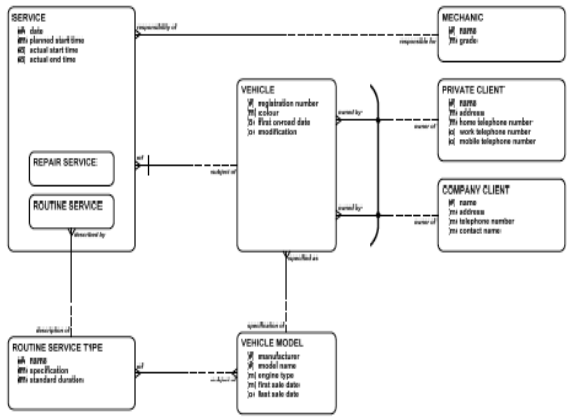


Figure 5 - Example information model drawn in 'Ellis-Barker' notation

UML class diagram, Ellis-Barker, Express-G, IDEX1, etc

Attributes

Identifier:
name:

modeling_language:

entity_name:

has_significance:

minimum_cardinality:

maximum_cardinality:

link_phrase:

Identifier:

attribute_name:

minimum_cardinality:

maximum_cardinality:

.....

Registered Metadata

21313143v1.0

Robinson Motor Vehicle Service Recording
Ellis--Barker

Private Client

has significance as a client of Robinson Motors who is the personal owner of a vehicle serviced by Robinson Motors

Zero

Many

of

34909300v1.0

Home Telephone Number

One

One



11179 and 19763 specify metadata registries

The purpose of these two related standards are to promote:

- + **common understanding** of information objects,
- + **management and re-use** of information objects over **time, space, and applications**
- + **harmonization and standardization** of information objects

within and across organizations





11179 and 19763 supporting metadata registries

Also promotes....

- + the linkage of **ontologies and concept systems to provide semantics** for the information objects that are registered,
- + **human and machine readable meaning** and thus **enhances and enables interoperability.**



Common administrative attributes are specified in 11179

- + Unique Identifier
- + Name(s)
- + Definition(s)
- + Administrative Status
- + Registration Status
- + Creation Date
- + Administrative Note(s)
- + Effective Date
- + Change Date(s)
- + Change Description(s)
- + Created By
- + Modified By
- + Origin
- + Until Date
- + Stewardship Information
- + Submitter Information
- + Reference Document(s)
- + Classifications
- + Concept "annotation"
- + ...



11179 Metadata Registries (MDR)

Six Parts:

- + 11179-1 Framework
- + 11179-2 Classifications
- + 11179-3 Registry **Metamodel** and Basic Attributes (Data Elements)
- + 11179-4 Formulation of Definitions
- + 11179-5 Naming and Identification Principles
- + 11179-6 Registration

All parts are used with 19763

These international standards are freely available at:

<http://standards.iso.org/ittf/PubliclyAvailableStandards/index.html>



11179 Status

- + 11179-1 Framework Ed 3 *Committee Draft*
 - + Overview of 11179 and basic concepts
 - + Expands the text on **metadata** and thus has broader applicability for the understanding, application and use of metadata

- + 11179-2 Classifications Ed 2 *International Standard*
 - + Describes how to create, manage and use a classification schemes in a metadata registry

- + 11179-3 Registry **Metamodel** and Basic Attributes Ed3 *Final Draft*
International Standard
 - + Metamodel of data elements to ensure that data is understandable and shareable. These items are to be specified and registered as **metadata items in a metadata registry**
 - + Introduces different types of metadata items (see 5.5); support for registration of Concept Systems (see 9.1); and finer-grained conformance options (see 4.3).



11179 Status cont.

- + 11179-4 Formulation of Definitions Ed2 *International Standard*
 - + Provides rules and guidelines for forming quality definitions for data elements and their component parts

- + 11179-5 Naming and Identification Principles Ed 3 *Committee Draft*
 - + Describes how to form conventions for naming data elements and their component parts

- + 11179-6 Registration Ed 3 *Working Draft*
 - + Specifies the roles and requirements for the registration process in an ISO/IEC 11179 metadata registry



19763 Metamodel Framework for Interoperability

- + Multi-part Standard
- + Two Technical Reports

19763 Core Model and Basic Mapping

In addition to using facilities from 11179...

- + Specifies a Core_Model for all parts of 19763
- + Models are comprised of Model_Elements
- + Service Model, Process Model, Role & Goal Model, Information Model, Ontology Model all inherit from Core Model

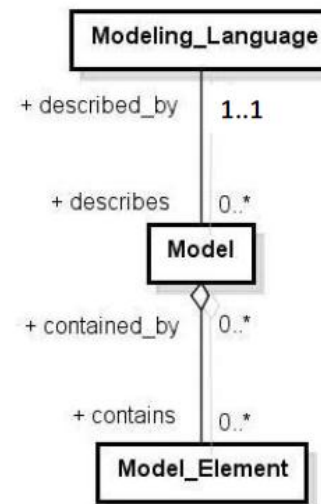


Figure 3 — Metamodel in the Core_Model package

ISO/IEC 19763 Metamodel Framework for Interoperability (MFI)

- + Part 1: Framework Ed2 *Working Draft*
- + Part 3: Metamodel for ontology registration – *International Standard*
- + Part 6: Registry summery – *Working Draft*
 - + *Specifies the attributes required for registration of a Registry*
- + Part-12 Metamodel for Information Models - *Committee Draft*
 - + generic framework for registering information models so mappings between models can be recognised and registered using the facilities specified in ISO/IEC 19763 Core Model and Mapping
 - + Express-G, IDEF1X, CASE, UML Class Diagrams, Entity-Relationship Modeling, Information Engineering

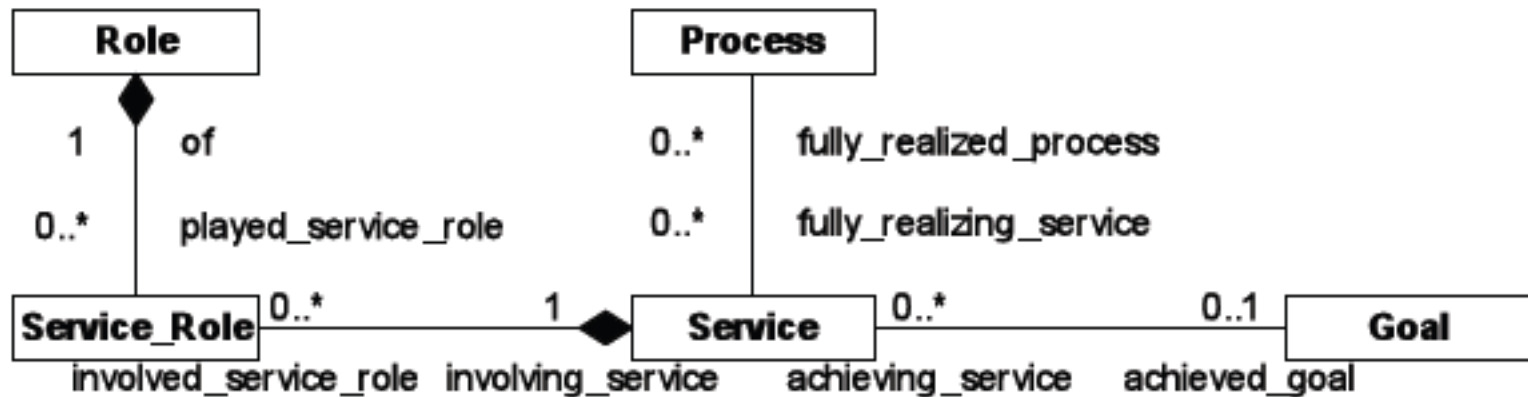
Registration of Services to enable “Role-Goal-Process-Service” discovery

Inter-related parts:

- + Part 5: Metamodel for process model registration - [Committee Draft](#)
 - + A process is collection of related, structured activities or tasks that achieve a particular business goal
 - + *UML, BPMN, IDEF0, IDEF3, PSL, etc*
- + Part 7: Metamodel for service registration - [Committee Draft](#)
 - + A service is a web based application encapsulating one or more computing modules and can be accessed by an interface
 - + *WSDL, WSMO, OWL-S, etc*
- + Part 8: Metamodel for role and goal registration - [Committee Draft](#)
 - + Supports service discovery based on user role and/or goal

ISO/IEC 19763 Metamodel Framework for Interoperability (MFI)

+ *Multipart Standard:*



19763 Part 12 Information Models

Program

May 30, 2012 – Open Forum on Metadata Registries

- 9:00 AM Welcome and Introduction
Sebastian C. Semler, TMF, Germany
- 9:10 AM ISO 11179 Metadata Registries (MDR) and ISO 19763 Metamodel Framework for Interoperability (MFI)
Denise Warzel, ISOWG2 Convenor, U.S. National Cancer Institute, USA
- 9:30 AM Healthcare: Mapping EHR Data to a Research Case Report Form: How a Metadata Repository, CDISC's SHARE, can improve the IHE profile Clinical Research Data (CRD)
Bain L, CDISC Liaison to Healthcare, USA; Evans J, CDISC Director of Technical Services, USA; Lastic P Y, Senior Director of Data Privacy and Healthcare Interoperability Standards, Sanofi-Aventis, France
- 10:05 AM Telecommunications: Metadata Requirements in Telecommunications Cloud Computing
Ewelina Szczekocka, Telekomunikacja Polska, Poland
- 10:40 AM Coffee Break
- 11:00 AM GeoSpatial: The Ingest, Storage, and Retrieval of Geopolitical Code Sets in a 11179 Metadata Registry
Gramm Richardson, U.S. Department of Defense, USA
- 11:35 AM Oxford MDR
Steve Harris, Jim Davies, Oxford Computing Laboratory, UK
- 12:10 PM Lunch
- 1:15 PM Telecommunications: Representing Semantics for User Oriented Service Compositions
Mariano Belaunde, Orange Labs, France
- 1:50 PM Healthcare: A National Metadata Repository for Empirical Research in Germany
Stausberg J, LMU Munich, Germany; Drepper J, TMF, Berlin, Germany; Löbe M, University of Leipzig, Germany; Ngouongo S, LMU Munich, Germany; Verplancke P, XClinical, Munich, Germany

- 2:25 PM Healthcare: The TMF and its Metadata and Linked Data Forum
Löbe M, University of Leipzig, Germany; Drepper J, TMF, Berlin, Germany; Stausberg J, LMU Munich, Germany; Verplancke P, XClinical, Munich, Germany
- 3:00 PM Break
- 3:20 PM Healthcare: Implementation of an ISOMECE 11179 Based Metadata Registry to Foster Interoperability of Health Telematics Applications
Bernhard Rimatzki and Peter Haas, Fachhochschule Dortmund, Germany
- 3:55 PM Healthcare: Sharing of OID Registry Information
Gessner C, TMF, Berlin, Germany; Thun S, Hochschule Niederrhein, Krefeld, Germany; Sabutsch S, ELGA GmbH, Vienna, Austria; Heitmann K, Heitmann Consulting and Services, Hürth, Germany
- 4:30 PM Closing Remarks

Schedule
Change



May 29, 2012 – TMF Forum Metadata and Linked Data Workshop (held in German language)

- 10:30 AM Introduction
- 10:40 AM ISO 11179 Edition 3 Metadata Registries (MDR)
Matthias Löbe, University of Leipzig, Germany
- 12:10 PM Lunch
- 12:40 PM Common Terminology Services Release 2 (CTS 2)
Robert Muetzner, Fachhochschule Dortmund, Germany
- 2:10 PM Coffee break
- 2:25 PM Operational Data Model (ODM)
Christian Bauer, University Medical Center Göttingen, Germany
- 3:25 PM Coffee break
- 3:40 PM Semantic Web Technologies
Magnus Knuth, Hasso-Plattner-Institute Potsdam, Germany
- 5:10 PM Summary and final discussion

Talk 1

- + **Healthcare: Mapping EHR Data to a Research Case Report Form: How a Metadata Repository, CDISC's SHARE, can improve the IHE profile Clinical Research Data (CRD)**
- + *Mr. Landen Bain, CDISC Liaison to Healthcare, Ms. Julie Evans, CDISC Director of Technical Services, Mr. Pierre Yves Lastic, Senior Director of Data Privacy and Healthcare Interoperability Standards, Sanofi-aventis*

Talk 2

- + **Telecommunications: Metadata requirements in telecommunications cloud computing**
- + *Ms. Ewelina Szczekocka, Telekomunikacja Polska*



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ISO/IEC 19763 Metamodel Framework for Interoperability (MFI)

+ *Multipart Standard:*

- + Part 1: Reference model
- + Part 3: Metamodel for ontology registration
- + **Part 5: Metamodel for process model registration**
- + Part 6: Registry summary
- + **Part 7: Metamodel for service registration**
- + Part 8: Metamodel for role and goal registration
- + **Part 10: Core model and basic mapping**
- + Part-12 Metamodel for information models
- + Two Technical Reports
 - + Part 9: On demand model selection based on Role-Goal-Process-Service (RGPS)
 - + Part 11 Structured registering

Danke	(German)
Thank You	(English)
謝謝	(Chinese)
ありがとう	(Japanese)
감사합니다	(Korean)
Dziękuję	(Polish)

For Attending From WG2!