	LRA Technical Model Infrastructure Specification Part 2: Participations			
	Programme	Informatics Data Standards	Document Record ID Key	
	Sub-Prog / Project	Logical Record Architecture for Health & Social Care	NPFIT-FNT-TO-DPM-0922-06	
	Prog. Director	D. Perry	Status	Draft for comment
	Owner	S. Bentley	Version	0.6
	Author	D. McGuffin	Version Date	28/07/2009

Logical Record Architecture for Health and Social Care

LRA Technical Model Infrastructure Specification Part 2: Participations

Amendment History:

Version	Date	Amendment History
0.1	13/02/2009	First draft for comment
0.2	25/03/2009	Updated following internal review. Major changes include: <ul style="list-style-type: none"> Renaming actor and materials packages as active and passive respectively Inclusion of ISO 21090 data types Inclusion of vocabulary lists in appendix
0.3	02/04/2009	Remodelled as Participations Reference Model and added Participations Clone Models Removed Passive Participant Content
0.4	29/04/2009	Update following internal review. Changes include: <ul style="list-style-type: none"> Correction of typographical errors and document formatting Further clarification added to introductory sections Remodelling due to removal of active and passive sub-packages Removal of NHS DD value set from CR_EntityPerson.birthOrderNumber Removal of references to NHS DD Sex value set and definitions from CR_EntityPerson.administrativeGenderCode
0.5	05/06/2009	Updated following external review, and to address areas of overlap with Care Components model. Changes are: <ul style="list-style-type: none"> Update of Introductory sections Introduction of Overlap with Care Components model Participations model changes as follows: <ul style="list-style-type: none"> CR_Participation generalized by Ira.technical.en13606.extract.FUNCTIONAL_ROLE CR_Participation.participationMode attribute deprecated Association between CR_Participation and CR_Role removed CR_Role generalized by Ira.technical.en13606.demographics.IDENTIFIED_ENTITY CR_Role.id and CR_Role.telecomDetails attributes deprecated Correction of associations between CR_Role and CR_RoleRelationship Expanded use of OCL constraints throughout Removal of Appendix D – Vocabularies for Coded Data Items
0.6	28/07/2009	Updated following internal review. Changes are: <ul style="list-style-type: none"> Removal of Participations Constrained Technical Models as now published as Participation Domain Models in LRA Release CR_Participation class moved to Care Components specification in extended package Renamed and updated multiplicity of CR_RoleRelationship associations Updated known issues section

Document Status:

This is a controlled document.

Whilst this document may be printed, the electronic version maintained in FileCM is the controlled copy. Any printed copies of the document are not controlled.

Related Documents:

These documents will provide additional information.

Ref no	Doc Reference Number	Title	Version
1	NPFIT-SHR-QMS-PRP-0015	Glossary of Terms Consolidated.doc	
2		Logical Record Architecture for Health and Social Care: Production Environment Project Plan	
3		Logical Record Architecture for Health and Social Care: Artefacts Overview	
4		LRA Technical Model Infrastructure Specification Part 1: Care Components	
5		LRA Technical Model Infrastructure Specification Part 3: Passive Participations	
6	External document	HL7 Version 3 Standard: Second Normative Edition - May 2006 [http://www.hl7.org]	
7		NPFIT-FNT-TO-DPM-0725.06 - NPfIT Message Implementation Manual 7.2.02	
8	External document	BS EN 13606-1:2007 - Health informatics – Electronic health record communication - Part 1: Reference model	
9	External document	BS EN 13606-3:2008 - Health informatics – Electronic health record communication - Part 3: Reference archetypes and term lists	
10		NHS Data Model and Dictionary Version 3 [http://www.datadictionary.nhs.uk]	

Glossary of Terms:

Term	Acronym	Definition
NHS CfH		NHS Connecting for Health
HL7		Health Level Seven
LRA		Logical Record Architecture
MIM		Message Implementation Manual
NHS		National Health Service
NHS DD		NHS Data Dictionary
SCG		Standards Consulting Group

Contents

1	About this Document	6
1.1	Purpose.....	6
1.2	Audience	6
1.3	Scope	6
1.4	Content.....	6
1.5	Overlap with Care Components Model	7
1.6	Assumptions.....	7
1.7	Known Issues.....	7
1.8	Class and Data Item Traceability	7
2	Introduction.....	8
2.1	LRA Participations Reference Model	8
2.2	Representation of Devices in Participations and Care Components Models.....	8
2.3	LRA PE Technical Model Infrastructure	11
3	LRA Participations Reference Model.....	13
3.1	Package lra.technical.participations	13
3.1.1	Abstract Class CR_Role	15
3.1.2	Class CR_RolePerson	16
3.1.3	Class CR_RoleOrganisation	18
3.1.4	Class CR_RoleDevice	19
3.1.5	Class CR_RoleIncidentalLocation	20
3.1.6	Abstract Class CR_Entity	21
3.1.7	Class CR_EntityPerson	23
3.1.8	Class CR_EntityOrganisation	26
3.1.9	Class CR_EntityDevice	27
3.1.10	Class CR_EntityPlace	28
3.1.11	Class CR_RoleRelationship	29
3.1.12	Class CR_LanguageCommunication	31
4	Overlap with Care Components Model.....	33
4.1	Representing Roles.....	33
4.2	Representing Participations	33
A	Assumptions.....	35
A.1	Role / Entity types vs. Class names:	35
A.2	Identification of Registered GP Details:.....	35

A.3	Vocabulary for Job Role Code	35
A.4	Location of Mobile Locations.....	35
B	Known Issues	36

1 About this Document

1.1 Purpose

This document describes the Participations reference model that forms part of the LRA Production Environment Technical Model Infrastructure. The reference models and constraint rules specified by the Technical Model Infrastructure underpin that part of the Model Development and Production Framework and the LRA Toolset used to construct computable Technical Model Artefacts [3] for use in LRA record of care specifications.

Generally speaking, the Participations reference model is a reconciliation of multiple models present in MIM 7.2.02 [7] for describing the participation of roles and entities that act in the health record. Thus the Participations reference model defines the involvement of entities and roles in the Logical Record Architecture for Health and Social Care (LRA).

Examples of entities include person, device and organisation, whereas examples of roles include patient, care professional and hospital departments. These entities and roles may participate in the LRA in various ways (e.g. as authors, performers, subject of care record etc.).

The specification of entities within the LRA Participations Reference Model is restricted to people, organisations, devices and places. Other entities such as substances and medication items shall be specified in the LRA Care Components Reference Model.

1.2 Audience

The intended audience of this specification is any individual, group or organisation involved in the development or use of the LRA.

1.3 Scope

The scope of this document covers the participation of entities and roles within the LRA.

1.4 Content

This document is divided into the following sections:

- Introduction
- LRA Participations Reference Model
- Overlap with Care Components Model
- Assumptions
- Known Issues

1.5 Overlap with Care Components Model

There is some overlap between the Participations and Care Components models in the specification of participation type and the identification of role and entities. This is discussed in detail in Section 4.

Additionally, there is some overlap between the Participations and Care Components models in the representation of devices. The reader is directed to section 2.2 for details on how to determine which model should be used in the specification of devices.

1.6 Assumptions

During the production of the LRA Participations Reference Model there were a small number of cases where multiple design approaches could have been taken (e.g. representation of a data item, choice of vocabulary for a data item). In each of these cases an assumption has been made to proceed with the preferred solution in the author's opinion. These assumptions are listed in Appendix B.

1.7 Known Issues

Appendix A contains a list of known issues that exist in the LRA Participations Reference Model.

1.8 Class and Data Item Traceability

Where possible, classes and data items within the LRA Participations Reference model have been traced to the equivalent artefact in the NHS Data Dictionary, HL7 RIM or EN 13606:2 models. It should be noted that this tracing is purely for informational purposes and should not be considered to be definitional.

2 Introduction

The Participations reference model, in keeping the purpose of the LRA Technical Model Infrastructure as a whole, is principally concerned with expressing record content logically, to satisfy meaningful automated data retrieval and re-use requirements rather than specifying a particular physical representation for communicating information between machine and user or between machines.

2.1 LRA Participations Reference Model

This section defines the participation of entities and roles in the LRA, and as such contains 2 main class types – role classes and entity classes.

Role classes establish the roles that entities play as they participate in the LRA. For example, a person entity instance may play the role of a care professional in one part of a subject of care's record and yet play the role of a third party in another part.

Entity classes represent the physical things and beings that are of interest to, and take part in the care process.

Participation classes are used to express the context of involvement of an entity in terms such as who performed it, for whom it was done, where it was done etc. The type of participation of an entity in the LRA is specified in the Care Components Model.

The LRA Participations Reference Model fulfils the following use cases:

- Identification and description of patients, care professionals, related entities, organisations, places and devices.
- Establishing the relationship between patients and third parties when the third party is required to be identified as the next of kin or as an informant, performer etc. within the healthcare process.

The LRA Participations Reference Model reconciles the following input requirements into a single model:

- NPFIT MIM 7.2.02 CDA role templates representing care professionals, patients, related entities, organisations, places and devices.
- NPFIT MIM 7.2.02 PDS message models and CMETs representing patient demographic information.
- Relevant NHS Data Dictionary definitions of the above.

2.2 Representation of Devices in Participations and Care Components Models

This section contains guidance on how to determine if a device should be specified in the Participations or Care Components models.

The guidance starts by classifying an entity as a device only if all of the following criteria are met:

- the entity is inanimate, and
- the entity is locationally independent, and
- the entity is manufactured (i.e. transformed for a particular purpose by a non-natural or manufacturing process), and
- the entity is used in an activity, but remains unchanged by that activity

If the device entity is capable of being identified as an instance, then it should be specified in the Participations model. Otherwise it should be specified in the Care Components model.

This guidance is also described in the following decision tree. Please note, that this decision tree only attempts to classify an entity as a device and then determine whether that device should be represented in the Participations or Care Components models. Classification of entities as people, organisations etc. is outside the scope of this decision tree.

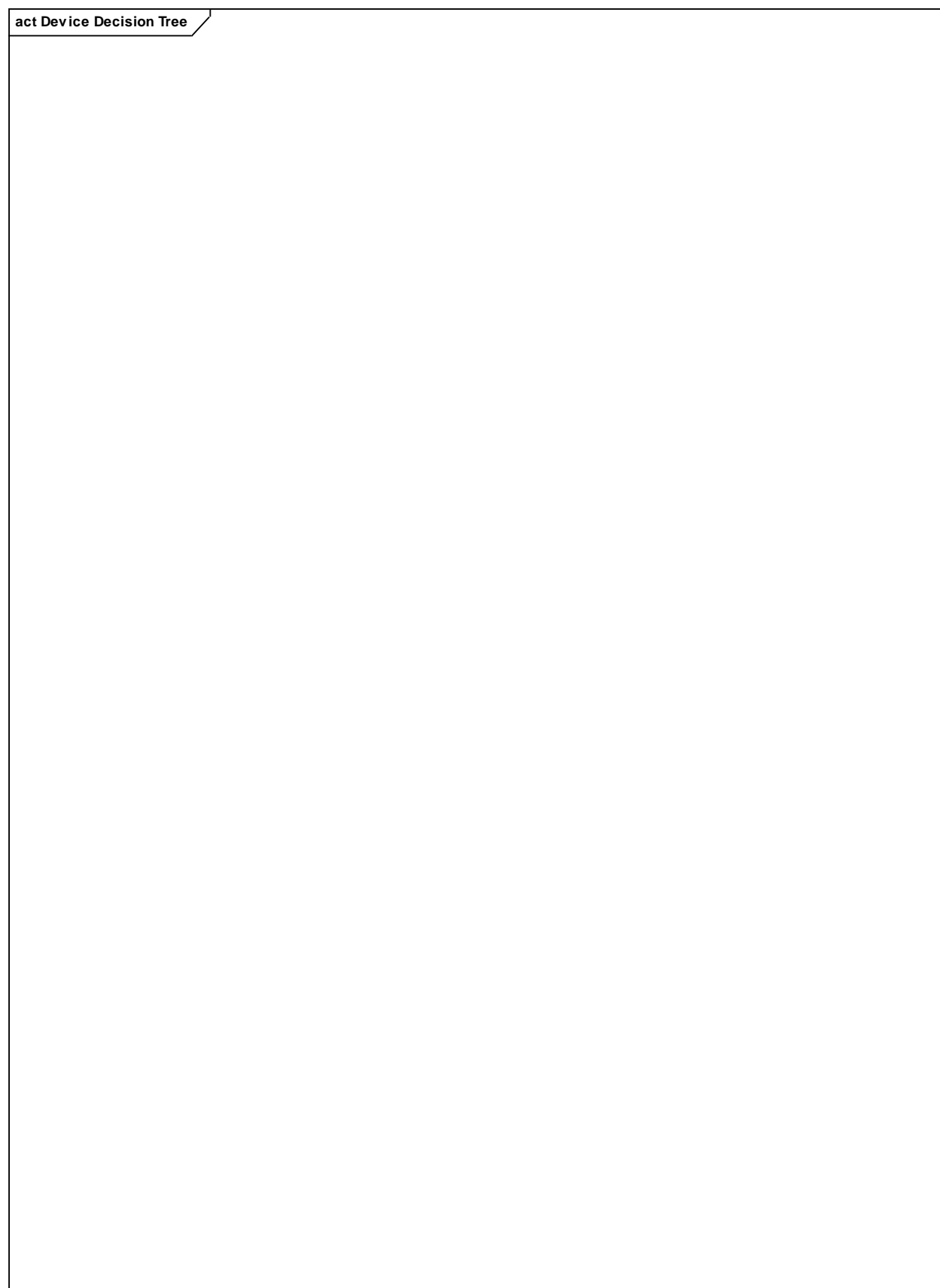


Figure 1 : Device Decision Tree

2.3 LRA PE Technical Model Infrastructure

The Participations reference model is one of a set of Static Model Specifications that form part of the LRA PE Technical Model Infrastructure that underpins the construction of computable Technical Model Artefacts. In addition to the Static Model Specifications, the Technical Model Infrastructure includes the following:

- Terminology Binding Technical Specification,
- Structural Constraint Specification,
- Instance Exemplifier Specification and
- Querying and Inferencing Specification.

The UML models upon which the Static Model Specifications are based are maintained as UML packages under a *lra* root package as shown in Figure 2 Package hierarchy of LRA PE Static Models below. The top level sub-packages of the *lra* hierarchy are:

- *artefacts* – specifies artefacts classes
- *datatypes* – specifies the data types used by the LRA
- *knowledge* – specifies the Knowledge Model Infrastructure
- *technical* – specifies the Technical Model Infrastructure

The Participations reference model classes, relationships and constraints are defined within the participations package of the *lra.technical* package.

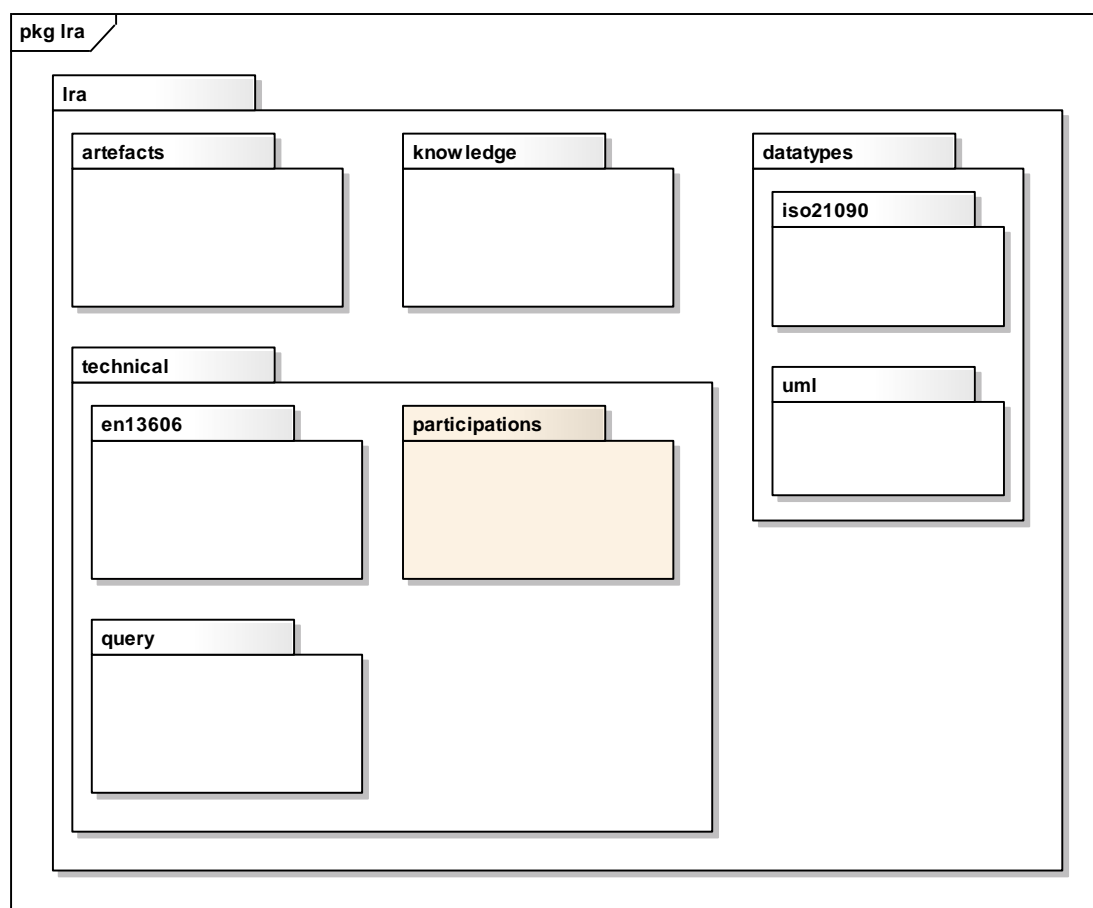


Figure 2: Package hierarchy of LRA PE Static Models

3 LRA Participations Reference Model

This section specifies the LRA Participations Reference Model.

3.1 Package `Ira.technical.participations`

The following sections specify the details of the participations package.

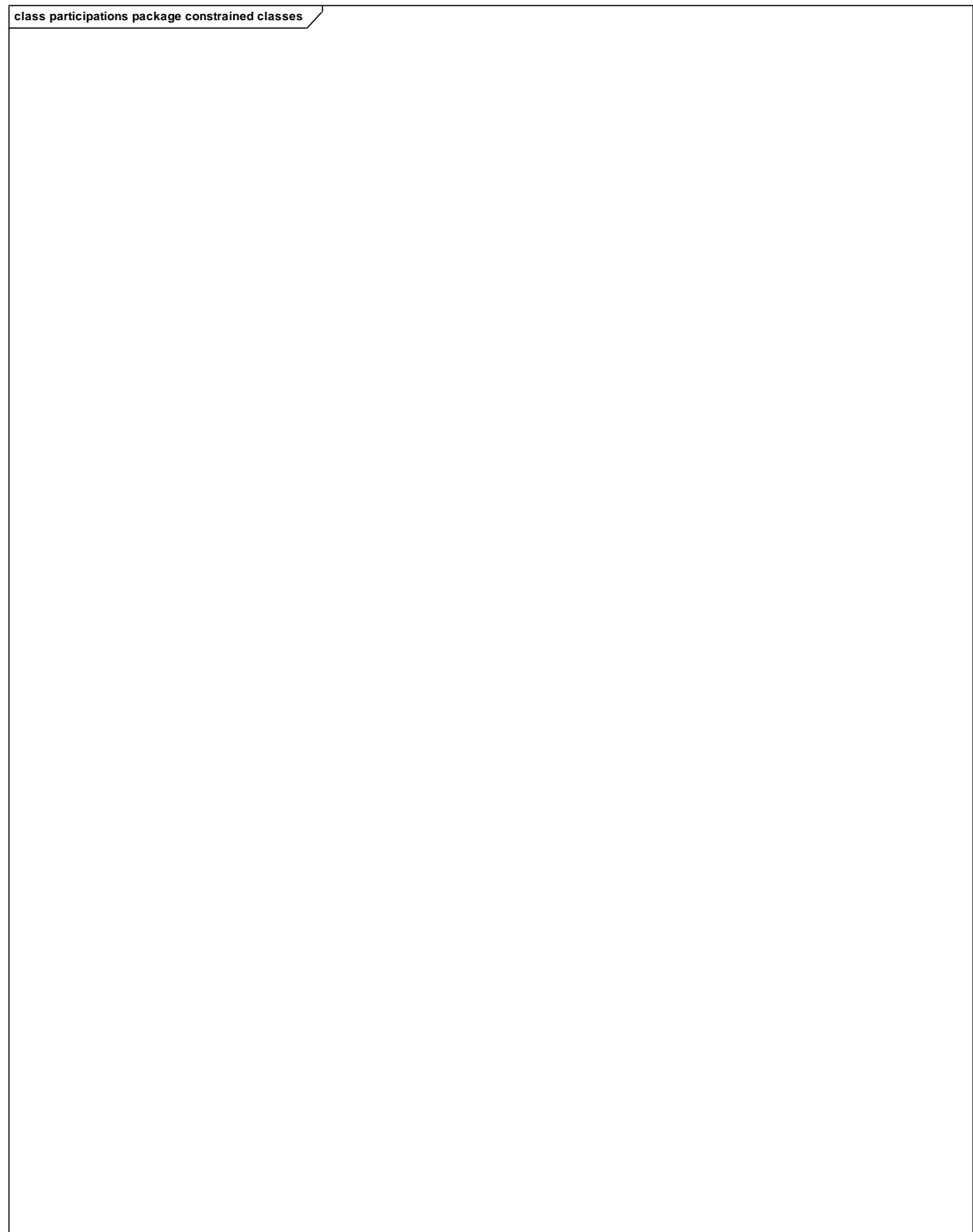


Figure 3: participations package constrained classes

3.1.1 Abstract Class CR_Role

Specialises: IDENTIFIED_ENTITY

Realises:

A class to carry details of a role (e.g. patient, healthcare professional, service delivery location, specimen) that is being played by an entity.

3.1.1.1 Attributes

Attribute	Description
address : AD [0..*]	<p>An attribute to represent an entity's postal address whilst playing this role.</p> <p><u>NHS Data Dictionary:</u></p> <ul style="list-style-type: none"> • ADDRESS: The identification of a place of relevance to a PERSON, an ORGANISATION, an ORGANISATION SITE or LOCATION. The address may have COMMUNICATION CONTACT INFORMATION associated with it and may be the location for an ACTIVITY. • ADDRESS STRUCTURED: An address comprised of address elements. Address elements correspond to the Royal Mail Postal Address File unless indicated otherwise. • ADDRESS UNSTRUCTURED: A recognizable postal address comprised of up to five lines of 35 alphanumeric characters. • PERSON OR ORGANISATION ADDRESS: An association of a PERSON, an ORGANISATION, an ORGANISATION SITE or a LOCATION with a particular ADDRESS. <p><u>Derivation:</u></p> <ul style="list-style-type: none"> • HL7: Role.addr • EN 13606: IDENTIFIED_ENTITY.POSTAL_ADDRESS

3.1.1.2 Relationships

Relationship Type	Source	Target	Description
Generalization	CR_RolePerson	CR_Role	CR_RolePerson specializes CR_Role.
Generalization	CR_RoleOrganisation	CR_Role	CR_RoleOrganisation specializes CR_Role.
Generalization	CR_RoleIncidentalLocation	CR_Role	CR_RoleIncidentalLocation specializes CR_Role.

Relationship Type	Source	Target	Description
Association	target CR_Role 1	inboundLink CR_RoleRelationship 0..*	A CR_Role may be the target of a CR_RoleRelationship from another CR_Role.
Association	source CR_Role 1	outboundLink CR_RoleRelationship 0..*	A CR_Role may be the source of a CR_RoleRelationship to another CR_Role.
Generalization	CR_RoleDevice	CR_Role	CR_RoleDevice specializes CR_Role.
Association	CR_Role 1	entity CR_Entity 0..1	A CR_Role may be played by a CR_Entity.
Generalization	CR_Role	IDENTIFIED_ENTITY	An IDENTIFIED_ENTITY is specialized by a CR_Role.

3.1.2 Class CR_RolePerson

Specialises: CR_Role

Realises:

A class to represent the role of a person.

Extends CR_Role to further define the properties that are pertinent to the role of a person.

NHS Data Dictionary:

- PATIENT:** A person with a specific disease or condition who receives treatment from a Health Care Provider, or any REGISTERABLE BIRTH. It is an entry on the PATIENT master index. This will be a PERSON, which includes neonates (babies aged 28 days or less), who use a hospital bed in order to receive clinical care/treatment or someone attending a clinic, day care facility, etc. It will also include people in the community receiving care under a specific NHS Service Agreements forming part of 'nursing care in the community'. This also includes PATIENTS on the ELECTIVE ADMISSION LIST who are awaiting elective admission.

- **META PATIENT:** This is a meta model class. A type of META PERSON ROLE IN ORGANISATION.
- **CARE PROFESSIONAL:** A PERSON who is professionally qualified to practise the delivery of care services.
- **META PERSON ROLE IN ORGANISATION:** This is a meta data class. A type of META AGENT representing an association between a META PERSON and a META ORGANISATION.
- **META CARE PROFESSIONAL:** This is a meta model class. A type of META PERSON ROLE IN ORGANISATION who is professionally qualified to practise the delivery of care services, such as a GP, nurse or social worker.
- **META CARER FOR PERSON:** This is a meta model class. A type of META AGENT in which one META PERSON provides non-professional care for another META PERSON. They are not directly employed to do so, although they may receive an allowance for providing care. For example, Arthur Springs cares for his wife, Alice.

3.1.2.1 Attributes

Attribute	Description
jobRoleCode : CD.CV [0..1]	<p>A coded representation of the person's job role.</p> <p>NHS Data Dictionary:</p> <ul style="list-style-type: none"> • JOB ROLE CODE: A National Code for a JOB ROLE TITLE of a JOB ROLE applicable to an EMPLOYEE, as required by the National Workforce Data Set. • META ROLE IN ACTIVITY: This is a meta model class. A role that a META AGENT plays in a META ACTIVITY. For example, in an appendectomy, the roles involved might be 'surgeon', 'anaesthetist', 'scrub nurse', 'assistant surgeon', 'trainee', etc. <p>Derivation:</p> <ul style="list-style-type: none"> • HL7: Role.code • HL7: Role.recipientRoleCode • EN 13606: HEALTHCARE_PROFESSIONAL_ROLE.position_or_grade

3.1.2.2 Relationships

Relationship Type	Source	Target	Description
Association	CR_RolePerson 1	language CR_LanguageCommunication 0..*	A CR_Person may have capability for many CR_LanguageCommunications.
Generalization	CR_RolePerson	CR_Role	CR_RolePerson specializes CR_Role.

Relationship Type	Source	Target	Description

3.1.2.3 Constraints

Constraint Type	Name	Details
LRA Invariant	jobRoleCode LRA vocab	--The value of attribute jobRoleCode.code is a member of the value set JobRoleCode inv: jobRoleCode.code.ocllsKindOf(JobRoleCode)
LRA Invariant	id contains a maximum of four members	-- Attribute id collection has a maximum of four members inv: id->size() >=0 and id->size() <= 4
LRA Invariant	role person must be played by person entity	--There exists in the association role entity collection an object of type CR_EntityPerson inv: entity->exists(i i.ocllsTypeOf(CR_EntityPerson))

3.1.3 Class CR_RoleOrganisation

Specialises: CR_Role

Realises:

A class to represent the role of an organisation.

Extends CR_Role to further define the properties that are pertinent to the role of an organisation.

NHS Data Dictionary:

- **ORGANISATION:** One or more people with a common purpose of function (e.g. a General Practice). This includes public, private or voluntary sector ORGANISATIONS whose activities encompass the funding or provision of health care and support services.
- **ORGANISATION SITE:** An ORGANISATION SITE is a single or conjoined piece of land, premises or part of the premises therein, on which facilities are operated and managed by one ORGANISATION.
- **DEPARTMENT:** A sub division of an ORGANISATION managed as a separate entity which deals with requests for services.

3.1.3.1 Attributes

Attribute	Description
careSettingType : CD.CV.SCT [0..1]	A coded representation of the type of care setting (e.g. Burns unit, Maternity unit, Paediatric department). <u>Derivation:</u> <ul style="list-style-type: none"> • HL7: Role.code • EN 13606: ORGANISATION.code

3.1.3.2 Relationships

Relationship Type	Source	Target	Description
Generalization	CR_RoleOrganisation	CR_Role	CR_RoleOrganisation specializes CR_Role.

3.1.3.3 Constraints

Constraint Type	Name	Details
LRA Invariant	id contains one member	-- Attribute id collection has one member inv: id->size() = 1
LRA Invariant	careSettingType LRA vocab	--The value of attribute careSettingType.code is a member of the value set CDACareSettingTypeSnCT inv: careSettingType.code.ocllsKindOf(CDACareSettingTypeSnCT)
LRA Invariant	role organisation must be played by organisation entity	--There exists in the association role entity collection an object of type CR_EntityOrganisation inv: entity->exists(i i.ocllsTypeOf(CR_EntityOrganisation))

3.1.4 Class CR_RoleDevice**Specialises:** CR_Role**Realises:**

A class to represent the role of a device.

Extends CR_Role to further define the properties that are pertinent to the role of a device.

3.1.4.1 Attributes

Attribute	Description
deviceType : CD.CV.SCT [0..1]	A coded representation of the type of device (e.g. Blood gas analyser). <u>Derivation:</u> <ul style="list-style-type: none"> HL7: Role.code

3.1.4.2 Relationships

Relationship Type	Source	Target	Description
Generalization	CR_RoleDevice	CR_Role	CR_RoleDevice specializes CR_Role.

Relationship Type	Source	Target	Description

3.1.4.3 Constraints

Constraint Type	Name	Details
LRA Invariant	id contains one member	-- Attribute id collection has one member inv: id->size() = 1
LRA Invariant	deviceType LRA vocab	--The value of attribute deviceType.code is a member of the value set DeviceTypeSnCT inv: deviceType.code.ocllsKindOf(DeviceTypeSnCT)
LRA Invariant	address is undefined in LRA	--Attribute address is undefined (i.e. value assignment is prohibited) inv: address.ocllsUndefined()
LRA Invariant	telecom is undefined in LRA	--Attribute telecom is undefined (i.e. value assignment is prohibited) inv: telecom.ocllsUndefined()
LRA Invariant	role device must be played by device entity	--There exists in the association role entity collection an object of type CR_EntityDevice inv: entity->exists(i i.ocllsTypeOf(CR_EntityDevice))

3.1.5 Class CR_RoleIncidentalLocation

Specialises: CR_Role

Realises:

A class to represent the role of an incidental location. An incidental location is a location in which health care services are not designated to be delivered (e.g. road traffic accident scene).

Extends CR_Role to further define the properties that are pertinent to the role of an incidental location.

NHS Data Dictionary:

- **LOCATION:** A physical LOCATION where PATIENTS are seen or where services exist or from which requests for ACTIVITIES are sent or any other place of interest to an ORGANISATION which is not recorded as an ORGANISATION or an ORGANISATION SITE.

3.1.5.1 Attributes

Attribute	Description
incidentalLocationType : CD.CV.SCT [1..1]	A coded representation of the type of incidental location (e.g. bedroom, railway station). <u>NHS Data Dictionary:</u>

Attribute	Description
	<ul style="list-style-type: none"> LOCATION TYPE CODE: A code identifying the type of LOCATION. <p><u>Derivation:</u></p> <ul style="list-style-type: none"> HL7: Role.code

3.1.5.2 Relationships

Relationship Type	Source	Target	Description
Generalization	CR_RoleIncidentalLocation	CR_Role	CR_RoleIncidentalLocation specializes CR_Role.

3.1.5.3 Constraints

Constraint Type	Name	Details
LRA Invariant	id is undefined in LRA	--Attribute id is undefined (i.e. value assignment is prohibited) inv: id.ocllsUndefined()
LRA Invariant	incidentalLocationType LRA vocab	--The value of attribute incidentalLocationType.code is a member of the value set IncidentalLocationTypeSnCT inv: incidentalLocationType.code.ocllsKindOf(IncidentalLocationTypeSnCT)
LRA Invariant	role incidental location must be played by place entity	--There exists in the association role entity collection an object of type CR_EntityPlace inv: entity->exists(i i.ocllsTypeOf(CR_EntityPlace))
Invariant	outboundLink is undefined	--Association role outboundLink is undefined (i.e. value assignment is prohibited) inv: outboundLink.ocllsUndefined()

3.1.6 Abstract Class CR_Entity

Specialises:

Realises:

A class to carry details of an entity (e.g. person, place, organisation, device, substance).

3.1.6.1 Attributes

Attribute	Description
determinerCode : CS [1..1]	A coded representation of whether this entity is a class or an instance. <u>Derivation:</u>

Attribute	Description
	<ul style="list-style-type: none"> HL7: Entity.determinerCode
name : EN [0..1]	<p>An attribute to represent an entity's name whilst playing this role.</p> <p><u>NHS Data Dictionary:</u></p> <ul style="list-style-type: none"> PERSON NAME: The unique identifier for a specific and ordered combination of words and titles by which a PERSON may be known. PERSON NAME STRUCTURED: A full name comprised of one or more separate PERSON NAME WORDS in sequence. The PERSON NAME must contain at least one PERSON NAME WORD of the type 'Person Family Name'. PERSON NAME UNSTRUCTURED: The full name of a PERSON expressed as a single textual record. ORGANISATION NAME: The name by which an ORGANISATION wishes to be known or the official name given to an ORGANISATION. LOCATION NAME: This records the name of the LOCATION of a DEPARTMENT or facility. <p><u>Derivation:</u></p> <ul style="list-style-type: none"> HL7: Entity.name HL7: Entity.desc EN 13606: IDENTIFIED_ENTITY.ENTITY_NAME

3.1.6.2 Relationships

Relationship Type	Source	Target	Description
Generalization	CR_EntityDevice	CR_Entity	CR_EntityDevice specializes CR_Entity.
Generalization	CR_EntityPlace	CR_Entity	CR_EntityPlace specializes CR_Entity.
Generalization	CR_EntityOrganisation	CR_Entity	CR_EntityOrganisation specializes CR_Entity.
Association	CR_Role 1	entity CR_Entity 0..1	A CR_Role may be played by a CR_Entity.

Relationship Type	Source	Target	Description
Generalization	CR_EntityPerson	CR_Entity	CR_EntityPerson specializes CR_Entity.

3.1.6.3 Constraints

Constraint Type	Name	Details
LRA Invariant	determinerCode LRA vocab	--The value of attribute determinerCode.code is a member of the value set LRAEntityDeterminer inv: determinerCode.code.ocllsTypeOf(LRAEntityDeterminer)

3.1.7 Class CR_EntityPerson

Specialises: CR_Entity

Realises:

A class to represent a person entity.

Extends the CR_Entity class to further define the properties of a person.

3.1.7.1 Attributes

Attribute	Description
administrativeGenderCode : CD.CV [0..1]	A coded representation of the current registered administrative gender of the person. Derivation: <ul style="list-style-type: none"> HL7: Person.administrativeGenderCode EN 13606: SUBJECT_OF_CARE_PERSON_IDENTIFICATION.administrativeGenderCode
ethnicCategory : CD.CV [0..1]	A coded representation of the ethnic category of the person. NHS Data Dictionary: <ul style="list-style-type: none"> ETHNIC CATEGORY CODE: The ethnicity of a PERSON, as specified by the PERSON. Derivation: <ul style="list-style-type: none"> HL7: Person.ethnicGroupCode
birthTime : TS.Birth [0..1]	The date (and time where available) the person was born. NHS Data Dictionary: <ul style="list-style-type: none"> PERSON BIRTH DATE: The date on which a PERSON was born or is officially deemed to have been born. Derivation: <ul style="list-style-type: none"> HL7: Person.birthTime

Attribute	Description
	<ul style="list-style-type: none"> EN 13606: SUBJECT_OF_CARE_PERSON_IDENTIFICATION.birthTime
deceasedTime : TS [0..1]	<p>The date (and time where available) the person died.</p> <p>NHS Data Dictionary:</p> <ul style="list-style-type: none"> PERSON DEATH DATE: The date on which a PERSON died or is officially deemed to have died. <p>Derivation:</p> <ul style="list-style-type: none"> HL7: Person.deceasedTime EN 13606: SUBJECT_OF_CARE_PERSON_IDENTIFICATION.deceasedTime
birthPlace : AD [0..1]	<p>A representation of the person's place of birth.</p> <p>Derivation:</p> <ul style="list-style-type: none"> HL7: Role.addr
birthOrderNumber : INT.Pos [0..1]	<p>In the case of multiple births for a single pregnancy, this attribute provides a representation of the order in which this person was born.</p> <p>NHS Data Dictionary:</p> <ul style="list-style-type: none"> BIRTH ORDER: The sequence in which the baby was born, if part of a delivery having multiple births. <p>Derivation:</p> <ul style="list-style-type: none"> HL7: Person.multipleBirthOrderNumber EN 13606: SUBJECT_OF_CARE_PERSON_IDENTIFICATION.birthOrderNumber

3.1.7.2 Relationships

Relationship Type	Source	Target	Description
Generalization	CR_EntityPerson	CR_Entity	CR_EntityPerson specializes CR_Entity.

3.1.7.3 Constraints

Constraint Type	Name	Details
LRA Invariant	administrativeGenderCode LRA vocab	<p>--The value of attribute administrativeGenderCode.code is a member of the value set LRAAdministrativeGender</p> <p>inv: administrativeGenderCode.code.ocllsTypeOf(LRAAdministrativeGender)</p>
LRA Invariant	ethnicCategoryCode LRA vocab	<p>--The value of attribute ethnicCategory.code is a member of the value set EthnicCategory</p> <p>inv:</p>

Constraint Type	Name	Details
		ethnicCategory.code.ocllsTypeOf(EthnicCategory)
LRA Invariant	name is of type EN.PN	--Attribute name is of type EN.PN inv: name.ocllsTypeOf(EN.PN)
LRA Invariant	administrativeGenderCode conditionally defined in LRA	-- Attribute administrativeGenderCode is undefined (i.e. value assignment is prohibited) if CR_RolePerson.id.root does not identify this person as a subject of care inv: cR_RolePerson.id->exists(root='2.16.840.1.113883.2.1.4.1') or cR_RolePerson.id->exists(root='2.16.840.1.113883.2.1.3.2.4.16.52') or cR_RolePerson.id->exists(root='2.16.840.1.113883.2.1.3.2.4.16.53') or cR_RolePerson.id->exists(root='2.16.840.1.113883.2.1.3.2.4.16.54') else administrativeGenderCode.ocllsUndefined()
LRA Invariant	deceasedTime conditionally defined in LRA	-- Attribute deceasedTime is undefined (i.e. value assignment is prohibited) if CR_RolePerson.id.root does not identify this person as a subject of care inv: cR_RolePerson.id->exists(root='2.16.840.1.113883.2.1.4.1') or cR_RolePerson.id->exists(root='2.16.840.1.113883.2.1.3.2.4.16.52') or cR_RolePerson.id->exists(root='2.16.840.1.113883.2.1.3.2.4.16.53') or cR_RolePerson.id->exists(root='2.16.840.1.113883.2.1.3.2.4.16.54') else deceasedTime.ocllsUndefined()
LRA Invariant	birthPlace conditionally defined in LRA	-- Attribute birthPlace is undefined (i.e. value assignment is prohibited) if CR_RolePerson.id.root does not identify this person as a subject of care inv: cR_RolePerson.id->exists(root='2.16.840.1.113883.2.1.4.1') or cR_RolePerson.id->exists(root='2.16.840.1.113883.2.1.3.2.4.16.52') or cR_RolePerson.id->exists(root='2.16.840.1.113883.2.1.3.2.4.16.53') or cR_RolePerson.id->exists(root='2.16.840.1.113883.2.1.3.2.4.16.54') else birthPlace.ocllsUndefined()
LRA Invariant	birthOrderNumber conditionally defined in LRA	-- Attribute birthOrderNumber is undefined (i.e. value assignment is prohibited) if CR_RolePerson.id.root does not identify this person as a subject of care inv: cR_RolePerson.id->exists(root='2.16.840.1.113883.2.1.4.1') or cR_RolePerson.id->exists(root='2.16.840.1.113883.2.1.3.2.4.16.52')

Constraint Type	Name	Details
) or cR_RolePerson.id- >exists(root='2.16.840.1.113883.2.1.3.2.4.16.53) or cR_RolePerson.id- >exists(root='2.16.840.1.113883.2.1.3.2.4.16.54) else birthOrderNumber.ocllsUndefined()

3.1.8 Class CR_EntityOrganisation

Specialises: CR_Entity

Realises:

A class to represent an organisation entity.

Extends the CR_Entity class to further define the properties of an organisation.

NHS Data Dictionary:

- **ORGANISATION:** One or more people with a common purpose of function (e.g. a General Practice). This includes public, private or voluntary sector ORGANISATIONS whose activities encompass the funding or provision of health care and support services.
- **ORGANISATION SITE:** An ORGANISATION SITE is a single or conjoined piece of land, premises or part of the premises therein, on which facilities are operated and managed by one ORGANISATION.
- **DEPARTMENT:** A sub division of an ORGANISATION managed as a separate entity which deals with requests for services.
- **META ORGANISATION:** This is a meta model class. A type of META AGENT comprising one or more people with a common purpose of function (e.g. a General Practice). This includes public, private or voluntary sector organisations whose activities encompass the funding or provision of health care and support services.

3.1.8.1 Attributes

Attribute	Description
description : ST [0..1]	A textual description of an organisation. In some circumstances this may be present in addition to the organisation's name. <u>Derivation:</u> <ul style="list-style-type: none"> • HL7: Organization.desc • EN 13606: ORGANISATION.desc
organisationType : CD.CV [0..1]	A coded representation of the type of organisation (e.g. General Medical Practice, Community Trust, Walk-in Centre). <u>NHS Data Dictionary:</u> <ul style="list-style-type: none"> • ORGANISATION TYPE: A list of ORGANISATION TYPES of ORGANISATIONS according to the nature of the ORGANISATION (e.g. NHS Trust, Health Authority etc).

Attribute	Description
	Derivation: <ul style="list-style-type: none"> HL7: Organization.standardIndustryClassCode EN 13606: ORGANISATION.code

3.1.8.2 Relationships

Relationship Type	Source	Target	Description
Generalization	CR_EntityOrganisation	CR_Entity	CR_EntityOrganisation specializes CR_Entity.

3.1.8.3 Constraints

Constraint Type	Name	Details
LRA Invariant	organisationType LRA vocab	--The value of attribute organisationType.code is a member of the value set CDAOrganizationType inv: organisationType.code.ocllsTypeOf(CDAOrganizationType)
LRA Invariant	name is of type EN.ON	--Attribute name is of type EN.ON inv: name.ocllsTypeOf(EN.ON)

3.1.9 Class CR_EntityDevice

Specialises: CR_Entity

Realises:

A class to represent a device entity.

Extends the CR_Entity class to further define the properties of a device.

3.1.9.1 Attributes

Attribute	Description
manufacturerModelName : SC [0..1]	A textual description of a manufacturer's model name. In addition this description may optionally be coded. Derivation: <ul style="list-style-type: none"> HL7: Device.manufacturerModelName EN 13606: SOFTWARE_OR_DEVICE.manufacturerModelName
softwareName : SC [0..1]	Used to carry a textual description of the name, version and release of software. In addition this description may optionally be coded. Derivation: <ul style="list-style-type: none"> HL7: Device.softwareName

Attribute	Description
	<ul style="list-style-type: none"> EN 13606: SOFTWARE_OR_DEVICE.desc
manufacturerName : ST [0..1]	<p>A textual description of the manufacturer's name.</p> <p>Derivation:</p> <ul style="list-style-type: none"> HL7: Device.desc

3.1.9.2 Relationships

Relationship Type	Source	Target	Description
Generalization	CR_EntityDevice	CR_Entity	CR_EntityDevice specializes CR_Entity.

3.1.9.3 Constraints

Constraint Type	Name	Details
LRA Invariant	name is undefined in LRA	<p>--Attribute name is undefined (i.e. value assignment is prohibited)</p> <p>inv: name.ocllsUndefined()</p>

3.1.10 Class CR_EntityPlace

Specialises: CR_Entity

Realises:

A class to represent a place entity.

Extends the CR_Entity class to further define the properties of a place.

NHS Data Dictionary:

- LOCATION:** A physical LOCATION where PATIENTS are seen or where services exist or from which requests for ACTIVITIES are sent or any other place of interest to an ORGANISATION which is not recorded as an ORGANISATION or an ORGANISATION SITE.

3.1.10.1 Attributes

Attribute	Description
description : ST [0..1]	<p>A textual description of a place. In some circumstances this may be present in addition to the place name.</p> <p>Derivation:</p> <ul style="list-style-type: none"> HL7: Place.desc
placeType : CS [0..1]	<p>A coded representation of the type of place (e.g. bed, building).</p> <p>Derivation:</p> <ul style="list-style-type: none"> HL7: Place.code

3.1.10.2 Relationships

Relationship Type	Source	Target	Description
Generalization	CR_EntityPlace	CR_Entity	CR_EntityPlace specializes CR_Entity.

3.1.10.3 Constraints

Constraint Type	Name	Details
LRA Invariant	placeType LRA vocab	--The value of attribute placeType.code is a member of the value set PlaceEntityType inv: placeType.code.ocllsTypeOf(PlaceEntityType)
LRA Invariant	name is of type EN.TN	--Attribute name is of type EN.TN inv: name.ocllsTypeOf(EN.TN)

3.1.11 Class CR_RoleRelationship**Specialises:****Realises:**

A class to represent a relationship between two roles.

3.1.11.1 Attributes

Attribute	Description
type : CD.CV [1..1]	<p>A coded representation of the type of role relationship. The potential uses for this attribute include the conveying of the HL7 'is scoped by' relationship.</p> <p>The code set to be used by this attribute will vary contextually, for example the role relationship type to relate a person to another person will differ from that required to relate a device to an organisation. To date, a single suitable code set has been identified - the MIM defined 'CDAPersonRelationshipType'. Obviously, further code sets need to be identified and work is ongoing in this area (including consideration of the SNOMED CT subject relationship contextual model).</p> <p>Derivation:</p> <ul style="list-style-type: none"> HL7: RoleLink.typeCode
relationshipValidityTime : QSET<TS> [0..1]	<p>A representation of the time period for which this relationship is valid.</p> <p>NHS Data Dictionary:</p> <ul style="list-style-type: none"> PERSON RELATIONSHIP START DATE: The date on which a relationship between one PERSON and the other begins. PERSON RELATIONSHIP END DATE: The date on which a relationship between one PERSON and the other ends. <p>Derivation:</p>

Attribute	Description
	<ul style="list-style-type: none"> HL7: Role.effectiveTime

3.1.11.2 Relationships

Relationship Type	Source	Target	Description
Association	target CR_Role 1	inboundLink CR_RoleRelationship 0..*	A CR_Role may be the target of a CR_RoleRelationship from another CR_Role.
Association	source CR_Role 1	outboundLink CR_RoleRelationship 0..*	A CR_Role may be the source of a CR_RoleRelationship to another CR_Role.

3.1.11.3 Constraints

Constraint Type	Name	Details
LRA Invariant	type LRA vocab	--The value of attribute type.code is a member of the value set LRARoleRelationshipType inv: type.code.ocllsKindOf(LRARoleRelationshipType)
LRA Invariant	members of relationshipValidityTime are of type IVL<TS>	inv: relationshipValidityTime->forAll(t t.ocllsKindOf(IVL<TS>))
LRA Invariant	source and target roles must be of correct type	-- If the association role source is of type CR_RolePerson then there exists in the association role target an object of type CR_RolePerson or CR_RoleOrganisation -- Else if the association role source is of type CR_RoleOrganisation then there exists in the association role target an object of type CR_RoleOrganisation -- Else if the association role source is of type CR_RoleOrganisation then there exists in the association role target an object of type CR_RoleOrganisation -- Else if the association role source is of type CR_RoleDevice then there exists in the association role target an object of type CR_RoleOrganisation -- Else association role target is undefined (i.e. value assignment is prohibited) inv: if source.ocllsTypeOf(CR_RolePerson) then (target.ocllsTypeOf(CR_RolePerson) or target.ocllsTypeOf(CR_RoleOrganisation)) else if source.ocllsTypeOf(CR_RoleOrganisation)

Constraint Type	Name	Details
		<pre> then target.ocllsTypeOf(CR_RoleOrganisation) else if source.ocllsTypeOf(CR_RoleDevice) then target.ocllsTypeOf(CR_RoleOrganisation) else target.ocllsUndefined() endIf </pre>

3.1.12 Class CR_LanguageCommunication

Specialises:

Realises:

A class used to represent details of a person's communication language.

3.1.12.1 Attributes

Attribute	Description
languageCode : CD.CV [1..1]	<p>A coded representation of the language communicated by a person.</p> <p><u>NHS Data Dictionary:</u></p> <ul style="list-style-type: none"> LANGUAGE CLASSIFICATION CODE: A classification of a Language used by a PERSON. <p><u>Derivation:</u></p> <ul style="list-style-type: none"> HL7: LanguageCommunication.languageCode
languageMode : CD.CV [0..1]	<p>A coded representation of the mode of communication used by a person (e.g. spoken, written, signed) including an indication of whether this is expressed or received.</p> <p><u>Derivation:</u></p> <ul style="list-style-type: none"> HL7: LanguageCommunication.modeCode
preferenceIndicator : BL.NonNull [0..1]	<p>A flag to indicate if the value in languageCode.code is the person's preferred language.</p> <p><u>NHS Data Dictionary:</u></p> <ul style="list-style-type: none"> LANGUAGE USAGE: Identifies whether the LANGUAGE CLASSIFICATION CODE identified is preferred for follow-up or whether another language is preferred. <p><u>Derivation:</u></p> <ul style="list-style-type: none"> HL7: LanguageCommunication.preferenceInd
interpreterRequiredCode : CD.CV [0..1]	<p>A coded representation of whether this person requires an interpreter.</p> <p><u>NHS Data Dictionary:</u></p> <ul style="list-style-type: none"> INTERPRETER REQUIRED INDICATOR: Identifies whether an interpreter is required for the purposes of communication between a CARE PROFESSIONAL and a PATIENT, during a course of treatment. <p><u>Derivation:</u></p> <ul style="list-style-type: none"> HL7: LanguageCommunication.proficiencyLevelCode

3.1.12.2 Relationships

Relationship Type	Source	Target	Description
Association	CR_RolePerson 1	language CR_LanguageCommunication 0..*	A CR_Person may have capability for many CR_LanguageCommunications.

3.1.12.3 Constraints

Constraint Type	Name	Details
LRA Invariant	languageCode LRA vocab	--The value of attribute languageCode.code is a member of the value set HumanLanguage inv: languageCode.code.ocllsTypeOf(HumanLanguage)
LRA Invariant	languageMode LRA vocab	--The value of attribute languageMode.code is a member of the value set LanguageAbilityMode inv: languageMode.code.ocllsTypeOf(LanguageAbilityMode)
LRA Invariant	interpreterRequiredCode LRA vocab	--The value of attribute interpreterRequiredCode.code is a member of the value set InterpreterRequiredIndicator inv: interpreterRequiredCode.code.ocllsTypeOf(InterpreterRequiredIndicator)

4 Overlap with Care Components Model

4.1 Representing Roles

The *EHR_EXTRACT*, *FUNCTIONAL_ROLE*, *RELATED_PARTY* and *AUDIT_INFO* classes are defined in the Care Components model to specify the participation in the care process of patients or service users and other parties with specified roles and responsibilities including care professionals, organisations and devices.

Demographic descriptions of the participating roles are represented by LRA-specific specialisations of the EN 13606-1:2007 abstract *IDENTIFIED_ENTITY* class (defined in the EN 13606-1:2007 demographics package). The specialisations themselves are defined within this Participations infrastructure specification. Each specialised role descriptor holds an extract identifier which it inherits from *IDENTIFIED_ENTITY* and whose value is unique within the body of the EHR. The *EHR_EXTRACT* class allows for the specification of the set of descriptors of the roles that participate within the extract. Each participation instance is then linked to the description of its participating role, where specified, via a reference to its EHR-unique extract identifier. This mechanism, which the general standard facilitates through use of *IDENTIFIED_ENTITY* and *EHR_EXTRACT* classes, allows the description of a role to be referenced by any number of participations without having to repeat the role details for each participation. Also it is designed to ensure that any *EHR_EXTRACT* can be interpreted in isolation if the recipient system does not have access to the services needed to decode the business identifiers used by the EHR Provider.

4.2 Representing Participations

The Care Components model defines a number of specific types of participation such as committer and attester as well as a general *other_participations* type. Each specific type of participation implies directly, and therefore has a fixed participation type as shown in Table 1. Furthermore, the participation time of each specific type of participation can be inferred from the surrounding context.

The general standard, however, does not allow specification of the participation type of any other additional participations. Within the LRA other participations may therefore be specified as being of type *CR_Participation* which extends the *FUNCTIONAL_ROLE* class to allow for the specification of the participation type and (optionally) participation time. However, because *CR_Participation* is an LRA-specific extension to EN 13606, any information specified by instances of the class is outside of the scope of interpretation by systems that conform to the general standard only.

Table 1: Participation types and temporal scope

Source class	Participation name	Target class	Reference to EHR-unique role id	Participation type	Implied / fixed	Temporal scope
ATTESTATION_INFO	attester	FUNCTIONAL_ROLE	performer	Authenticator (AUTHEN)	yes	ATTESTATION_INFO.time
COMPOSITION	committal	AUDIT_INFO	committer	Data entry person (ENT)	yes	AUDIT_INFO.time_committed
		AUDIT_INFO	ehr_system	Device (DEV)	yes	
	composer	FUNCTIONAL_ROLE	performer	Author (AUT)	yes	COMPOSITION.session_time
	other_participations	FUNCTIONAL_ROLE or lra.technical.participations. CR_Participation	performer	Any value from LRAParticipationType except AUT.	no	
EHR_EXTRACT	-	-	authorising_party	Responsible Party (RESP)	yes	EHR_EXTRACT.time_created
	-	-	ehr_system	Device (DEV)	yes	
	-	-	subject_of_care	Record target (RCT)	yes	
ENTRY	info_provider	FUNCTIONAL_ROLE	performer	Informant (INF)	yes	COMPOSITION.session_time or (CLUSTER.obs_time or ELEMENT.obs_time) or CR_Participation.time
	other_participations	FUNCTIONAL_ROLE or lra.technical.participations. CR_Participation	performer	Any value from LRAParticipationType except INF.	no	
	subject_of_information	RELATED_PARTY	party	Subject (SBJ)	yes	CLUSTER.obs_time or ELEMENT.obs_time
RECORD_COMPONENT	feeder_audit	AUDIT_INFO	committer	Data entry person (ENT)	yes	AUDIT_INFO.time_committed
		AUDIT_INFO	ehr_system	Device (DEV)	yes	

A Assumptions

This appendix contains a number of assumptions that have been made during the production of this version of the LRA Participations Reference Model.

A.1 Role / Entity types vs. Class names:

In HL7 v3 there is no intention to derive semantic information from class names; instead this is carried using structural attributes of classes such as Entity.classCode and Role.classCode. This version of the LRA Participations Reference Model however takes the opposing stance and assumes that it is adequate for entity and role types to be derived from the class names, e.g. CR_EntityOrganisation.

A.2 Identification of Registered GP Details:

PDS messages within MIM 7.2.02 allow the identification of a subject of care's registered GP in 2 ways – identification of the actual GP, or identification of the GP Practice. It is understood that in future a patient will only be registered with a GP Practice on PDS, therefore this version of the Participations model assumes that it is adequate to only allow the representation of a registered GP Practice.

A.3 Vocabulary for Job Role Code

The representation of Job Role Code in CR_RolePerson.jobRoleCode is based upon the MIM representation of the same data item. However, the MIM does not identify a single vocabulary for use with this data item nationally, instead expecting the vocabularies used in local systems to be used. Usage of this data item in this way makes it unsuitable for machine processing purposes. It is therefore assumed that the vocabulary identified for use with the Workforce Data Set / NHS Electronic Staff Record is a suitable alternative for use with this data item within the LRA.

A.4 Location of Mobile Locations

One of the intended uses of the representation of places in the LRA is intended to cover mobile locations such as the back of an ambulance. It is assumed that the location, (in the example above, the location of the ambulance) or organisational properties (e.g. the NHS Trust an ambulance belongs to) of mobile locations are not required in the LRA.

B Known Issues

Table 2: Known Issues

Issue Id	Product	Version Identified	Title	Description	Severity	Date Issue Raised
1155	LRA Participations Specification	0.4	Unsuitable values exist in the SNOMED CT UK CDA Care Setting Type subset	The CR_RoleOrganisation.careSettingType attempts to specify the type of service location in which a participation took place. The specified vocabulary (SNOMED CT UK CDA Care Setting Type subset) contains a small number of unsuitable values (e.g. Dumfries and Galloway health board).	S	21/05/2009
1164	LRA Participations Specification	0.4	Overlap between participations person relationship type and SNOMED subject relationship context	One use of CR_RoleRelationship.type is to describe the type of relationship between a third party and the subject of care - the NHS DD derived CDAPersonRelationshipType vocabulary is specified for this use. However, this vocabulary overlaps with the SNOMED CT subject relationship context. The overlap needs to be resolved.	C	29/05/2009
1200	LRA Participations Specification	0.2	Representation of language skills	The representation of language skill sin the LRA Participations Reference Model is strongly based on the MIM representation of the same subject. Representation of language skills may be reviewed by the Standards Consulting Group (SCG). Therefore this area is subject to change based on any recommendations made by the SCG.	S	25/03/2009
1201	LRA Participations Specification	0.5	Representation of administrative gender	The representation of administrative gender in the MIM makes use of the NHS DD vocabulary 'Sex'. However, this vocabulary describes sex rather than administrative gender. Therefore, no suitable vocabulary has been identified for use in the LRA for the representation of administrative gender.	S	28/07/2009
1202	LRA Participations	0.5	Representation of role relationship type	There are many relationship types to be described by CR_RoleRelationship.type based on the type of the source	S	28/07/2009

	Specification			and target roles. For example, the type of relationship between 2 person roles is different to the type of relationship between 2 organisation roles. The specification of vocabularies for use with this data item is currently incomplete. [Related to issue 1164]		
--	---------------	--	--	---	--	--