POINT-OF-CARE IDENTITY MANAGEMENT

(PCIM)

Thanks, PCIM Work Group Stalwarts

- Stan Wiley, Draeger
- Chris Courville, Epic
- Doug Pratt, Cerner

What's the problem?

- As things get more fluid around the point-of-care (infusion pumps, anyone), association of device data with patients becomes more challenging
- We can't have device data flowing into the wrong patient's chart
- We don't want missing data due to relying on unsynchronized ADT messages

Message design goals

- Provide for standards-based (HL7 v2), not proprietary, information flows about device-to-patient associations
- Use existing standards for patient identity management (e.g. IHE ITI Patient Administration Management, IHE ITI Patient Demographic Query)
- Support a variety of workflows
- Support an analog of the master patient index, but for device-patient associations

Message design goals, contd.

- Detect and notify on conflicting information
- Support a variety of “divisions of labor” between:
  - devices
  - gateways
  - automated identification and data capture (AIDC) infrastructure (e.g. barcode systems, RFID systems)
  - User interfaces for human confirmation including handheld devices

Basic messages

- Existing ITI PDQ messages: list candidate patient identities
- Support: Register a device
- Assert an association between a patient and one or more devices is either starting, or ending (ends are as important as starts for preventing improperly associated data)
- Query devices associated with a patient
- Query patient associated with a device (so a device with no UI for patient identification can nonetheless access patient identity)

What's coming

- White paper, semi-final coming to an email address near you 'real soon'
- PCD Technical Committee will provide comments and recommend to Planning Committee (or not)
- PCD Planning Committee will convey to IHE for publication (or not)

DISCUSSION

Principle #1

Incorrect association of patient and device data can contribute to improper treatment which can be harmful or fatal to patients.

Risk management is **key**

- Has to be based on a process (see the pertinent consensus standards)
- Has to be done in context (involving the people who REALLY know the real, local, context) – generic analyses can get you only so far

Context

- Deployment is institution-specific or unit-specific
  - Workflows differ
  - Equipment differs
  - Clinical management and practitioner preferences differ
- (So, there need to be choices available)
- AND, there needs to be analysis of all these aspects of context in the institutions *quality system* and *risk analysis* practices

Document goals

- Background
- Suggested HL7 v2 message content

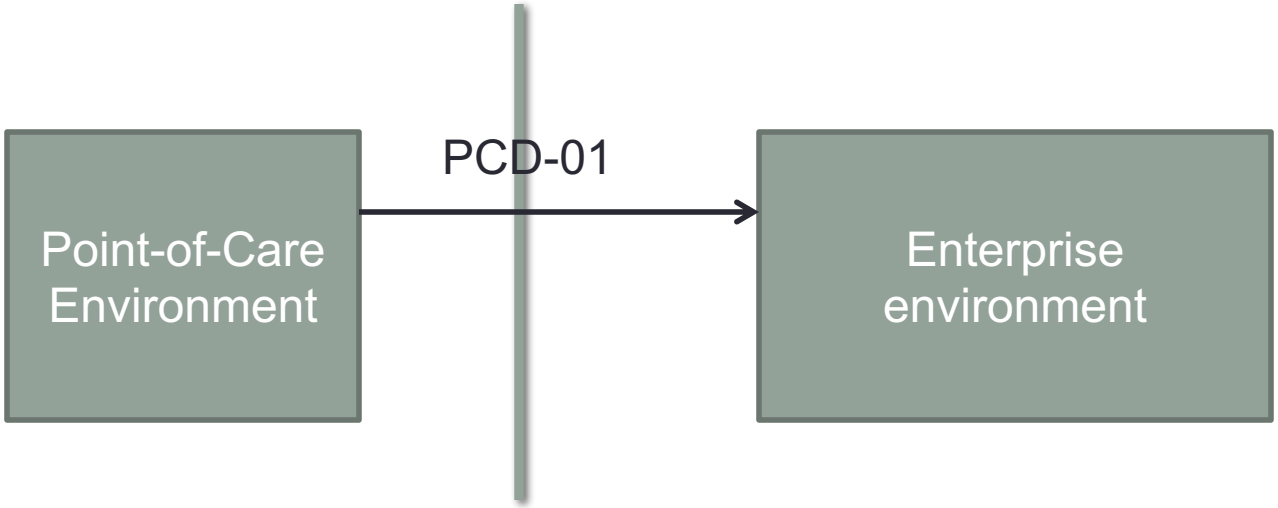
- Risk analysis best practices
- Security best practices

CURRENT PCD PRACTICE

What we have so far in the Technical Framework

- A prohibition in PCD-01 on sending device data to the enterprise unless it is marked (by sufficient data in the PID segment) as to who it belongs to
- How the association is made is the responsibility of the point-of-care system (for example, a monitoring gateway).
  - Separate admission (operator interaction, or perhaps, barcode or similar)
  - May be in collaboration with enterprise systems (patient index, cross-reference index?)

The key boundary



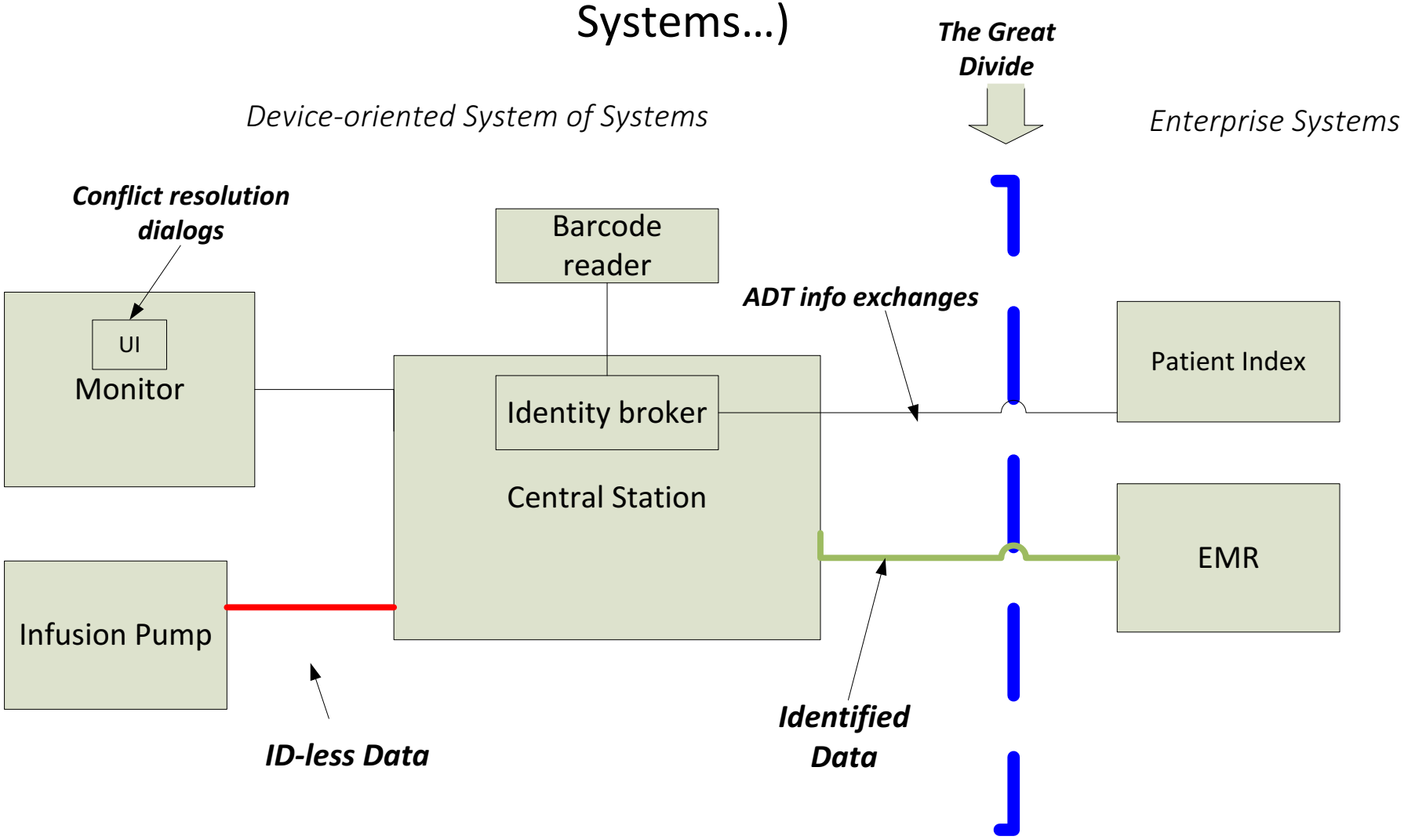
Unidentified data doesn’t cross the boundary

PCIM EXTENSIONS

ID-less Devices

Some devices have little perceived need and little capability for dealing with patient identity data, but somewhere within the system of systems the association to patient identity must be asserted and verified.

Hypothetical System of Systems (of Systems…)



Relevant IHE IT Infrastructure

- Patient Administration Management (PAM) – track an ADT (admit, discharge, transfer) HL7 stream
- Patient Data Query (PDQ) – HL7 query – you send you're the identity factors you know, you get identity (might be a list of identities consistent with your inputs)
- That is, data flow can be two-way across the POC-Enterprise boundary

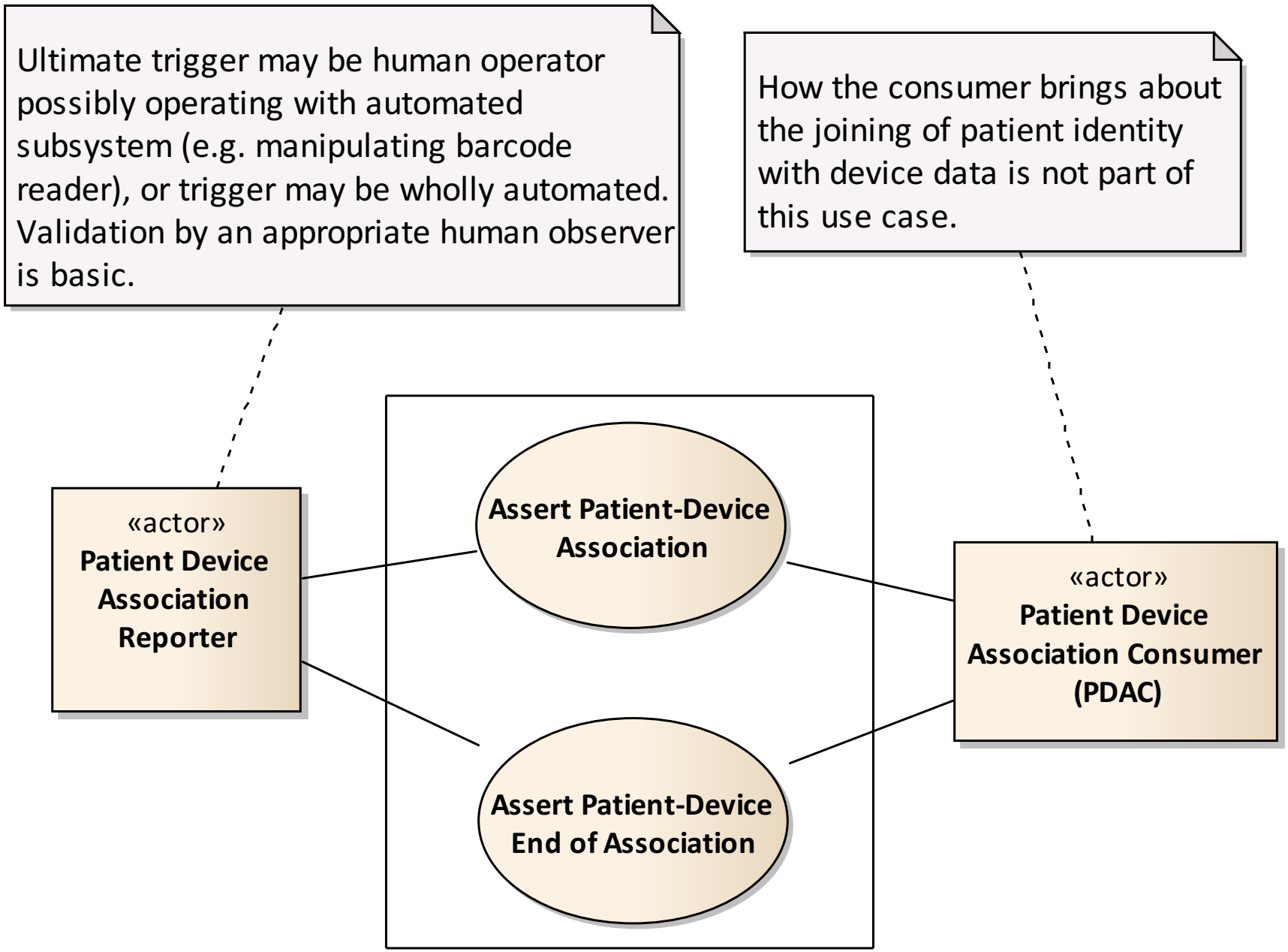
Weak and strong identity factor

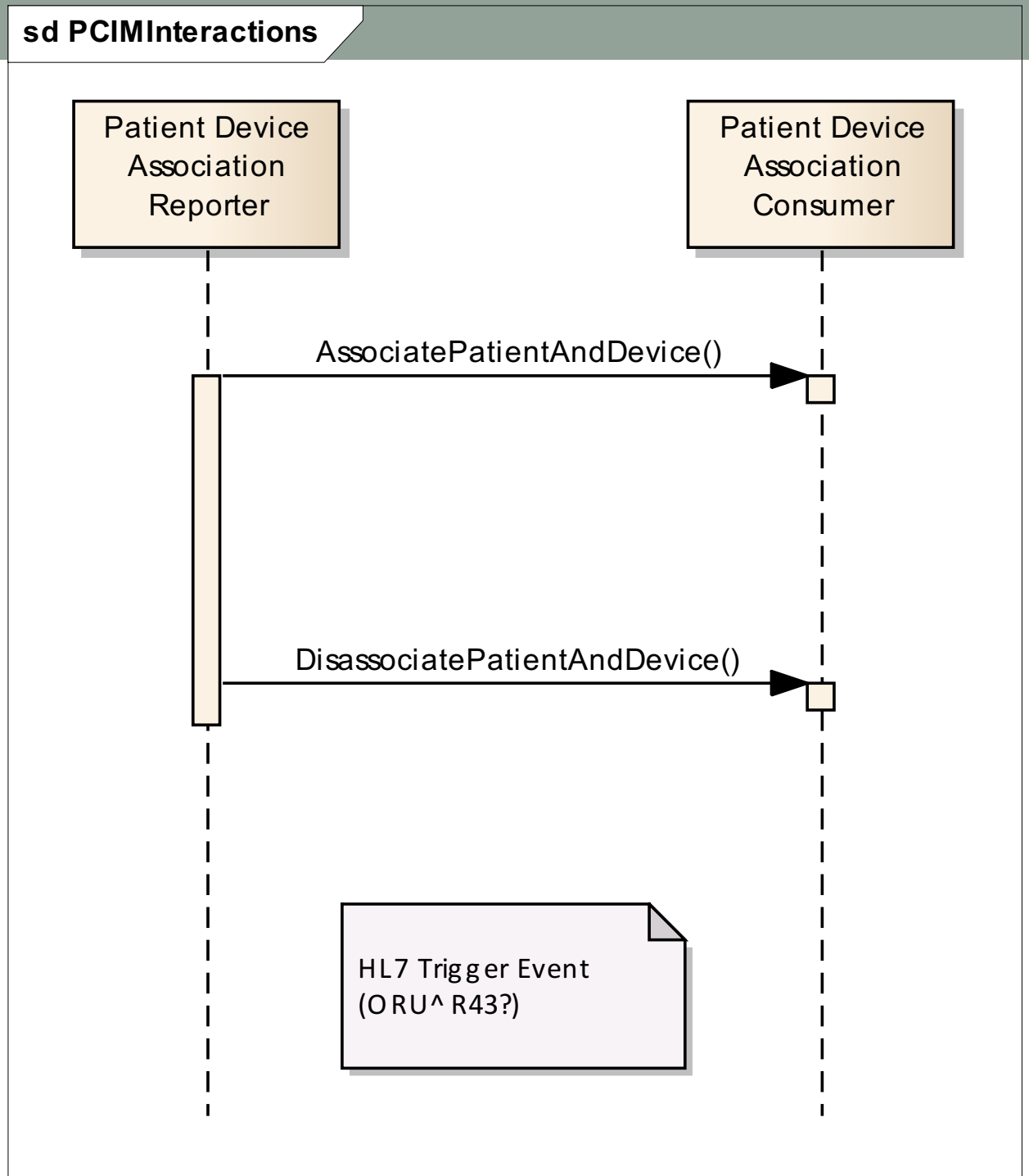
- A strong identity factor is designed to uniquely identify the patient. Ex. A medical record number from an assigning authority. A barcode or RFID tag should provide one.
- A weak identity does not, taken by itself, uniquely identify the patient but can contribute to a probable identification (name, gender, date of birth). If such a compound of identity factors must be used, risk analysis is indicated.

Conflict resolution

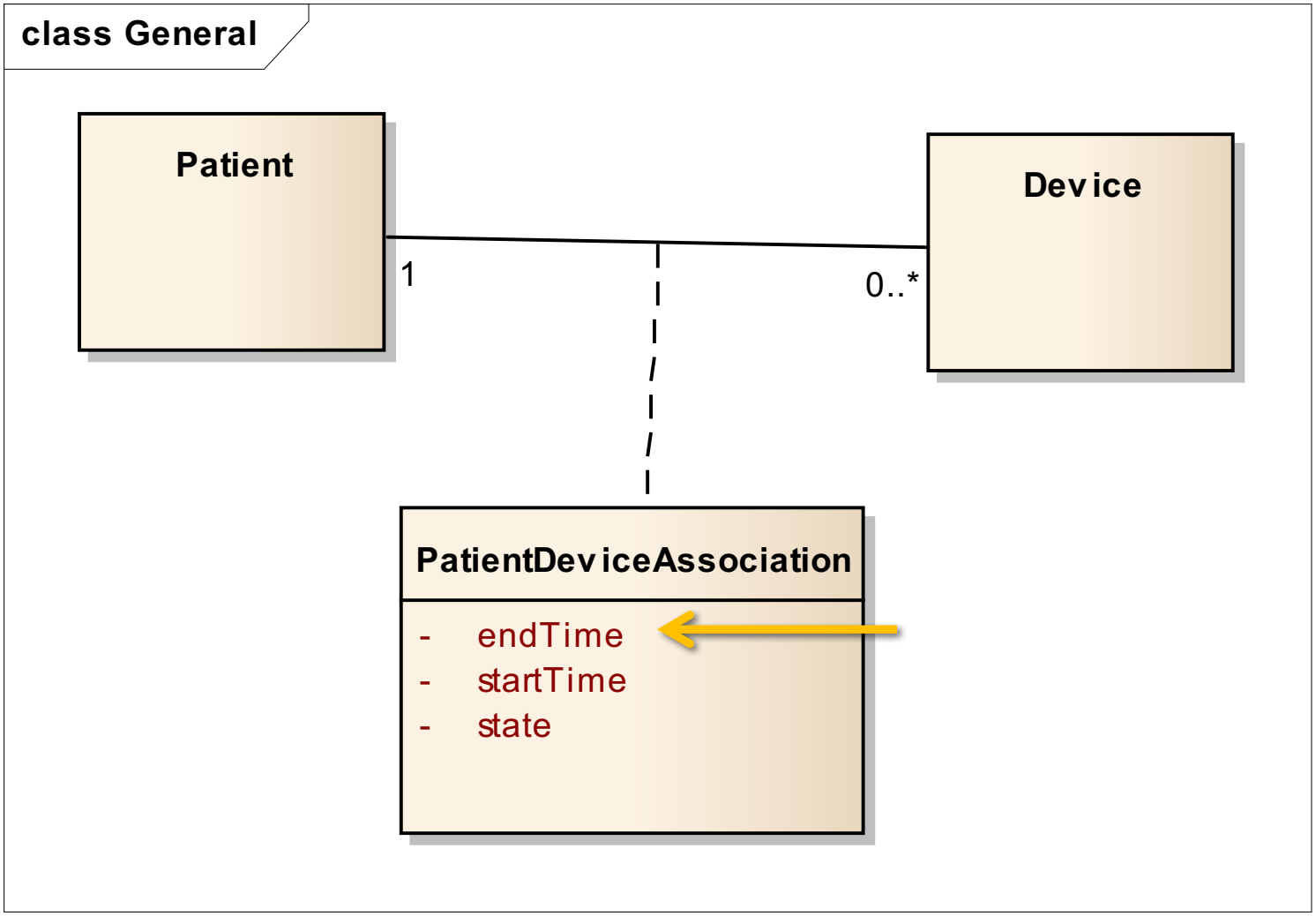
- There may be times when inconsistent Patient-Device association assertions exist in the system
- To what extent can automation help in a particular point in the workflow?
- But in general when inconsistency detected: then user interface presents information to a person for so that they may resolve the problem

USE CASES


Ultimate trigger may be human operator possibly operating with automated subsystem (e.g. manipulating barcode reader), or trigger may be wholly automated. Validation by an appropriate human observer is basic.
How the consumer brings about the joining of patient identity with device data is not part of this use case.
«actor»
Patient Device Association Reporter
Assert Patient-Device Association
Assert Patient-Device End of Association
«actor»
Patient Device Association Consumer (PDAC)


sd PCIMInteractions
Patient Device Association Reporter
Patient Device Association Consumer
AssociatePatientAndDevice()
DisassociatePatientAndDevice()
HL7 Trigger Event (ORU^R43?)

Ends are as important as Starts



Is there a need to support a device asking what patient it is associated with?

- Yes

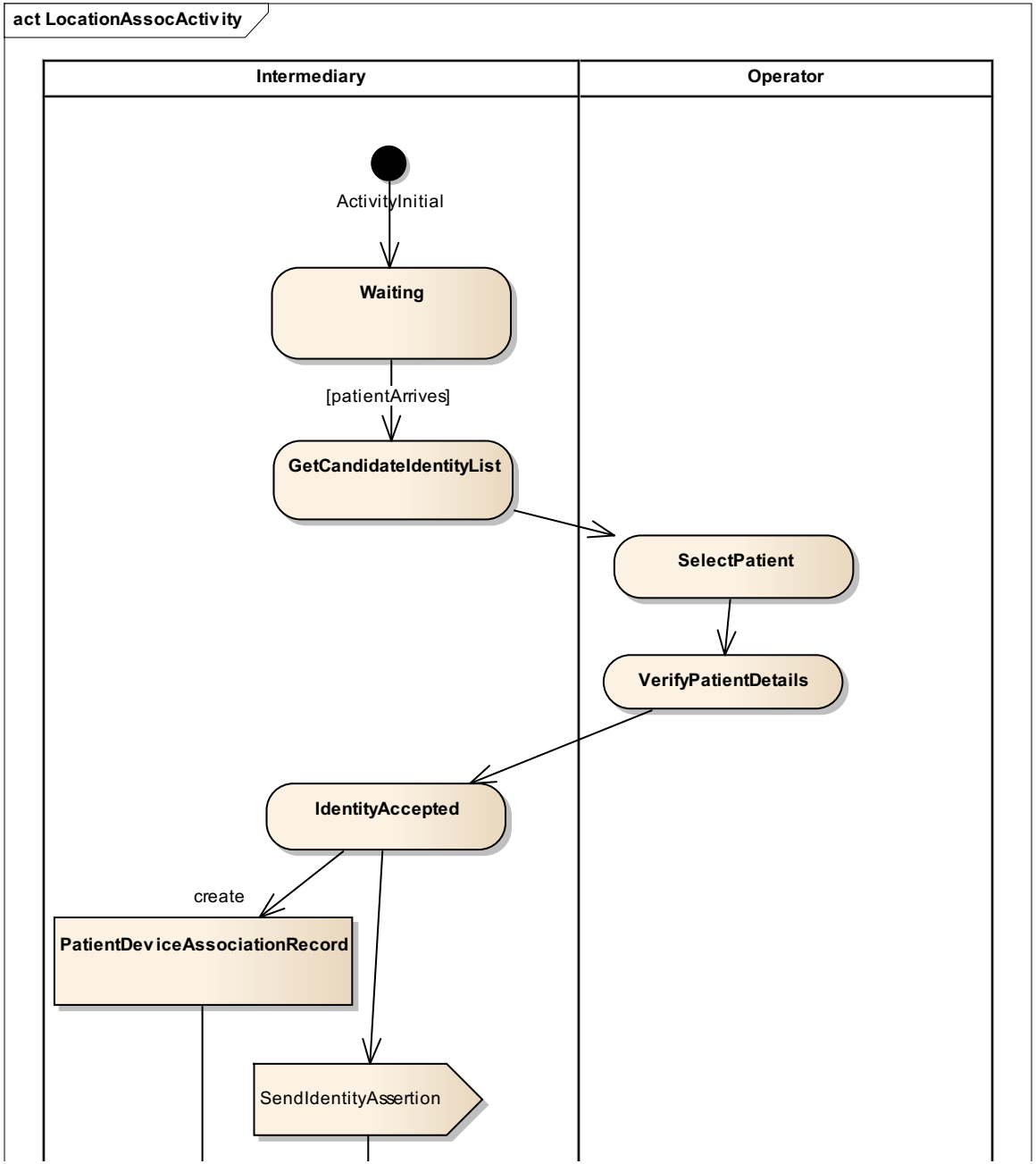
So, Transactions needed

- Device to Patient Association Assertion
- Device to Patient Association Query
- Device to Patient Association Conflict Notification

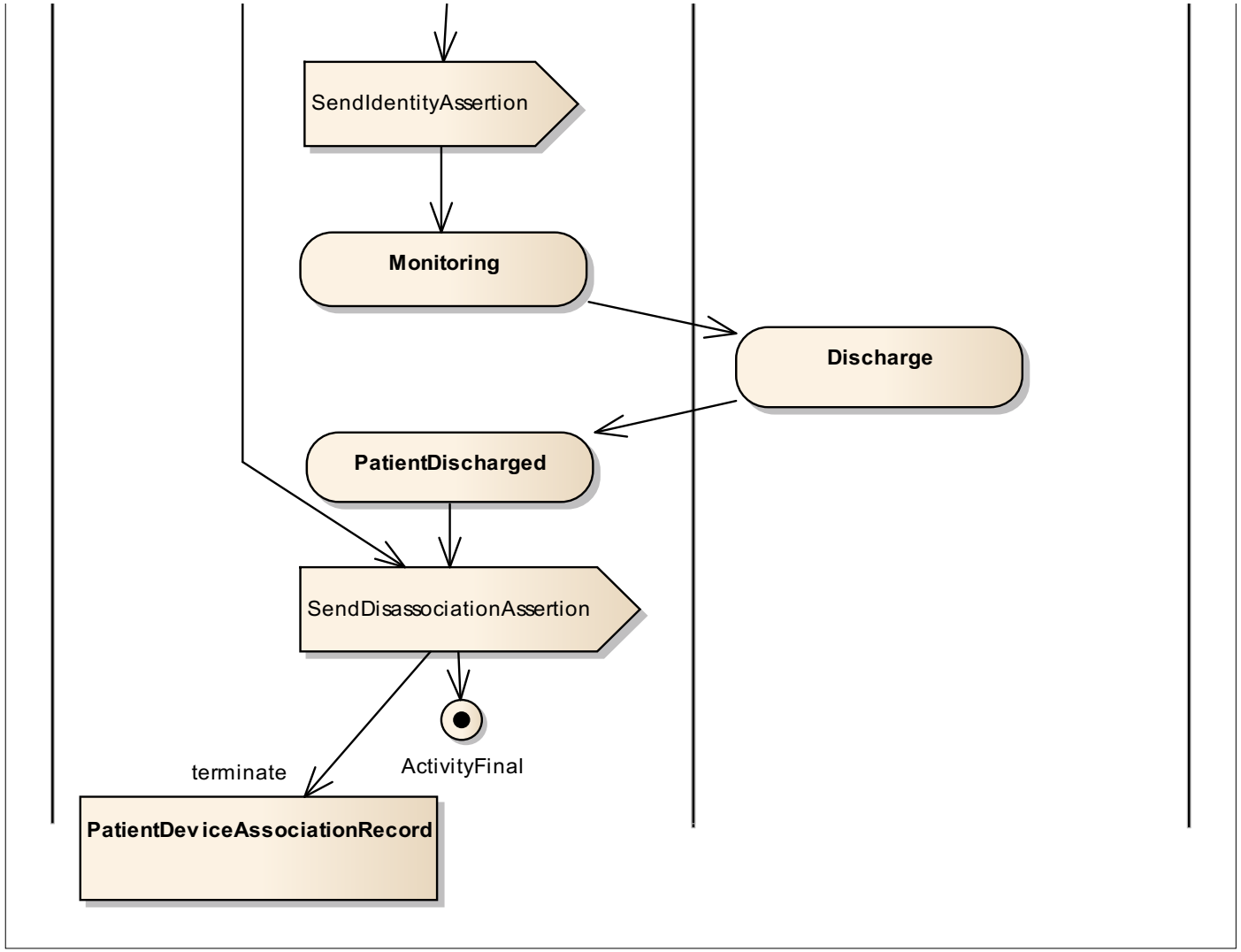
ONE SAMPLE WORKFLOW

How do the transactions fit in

How does it fit together: One workflow, part 1

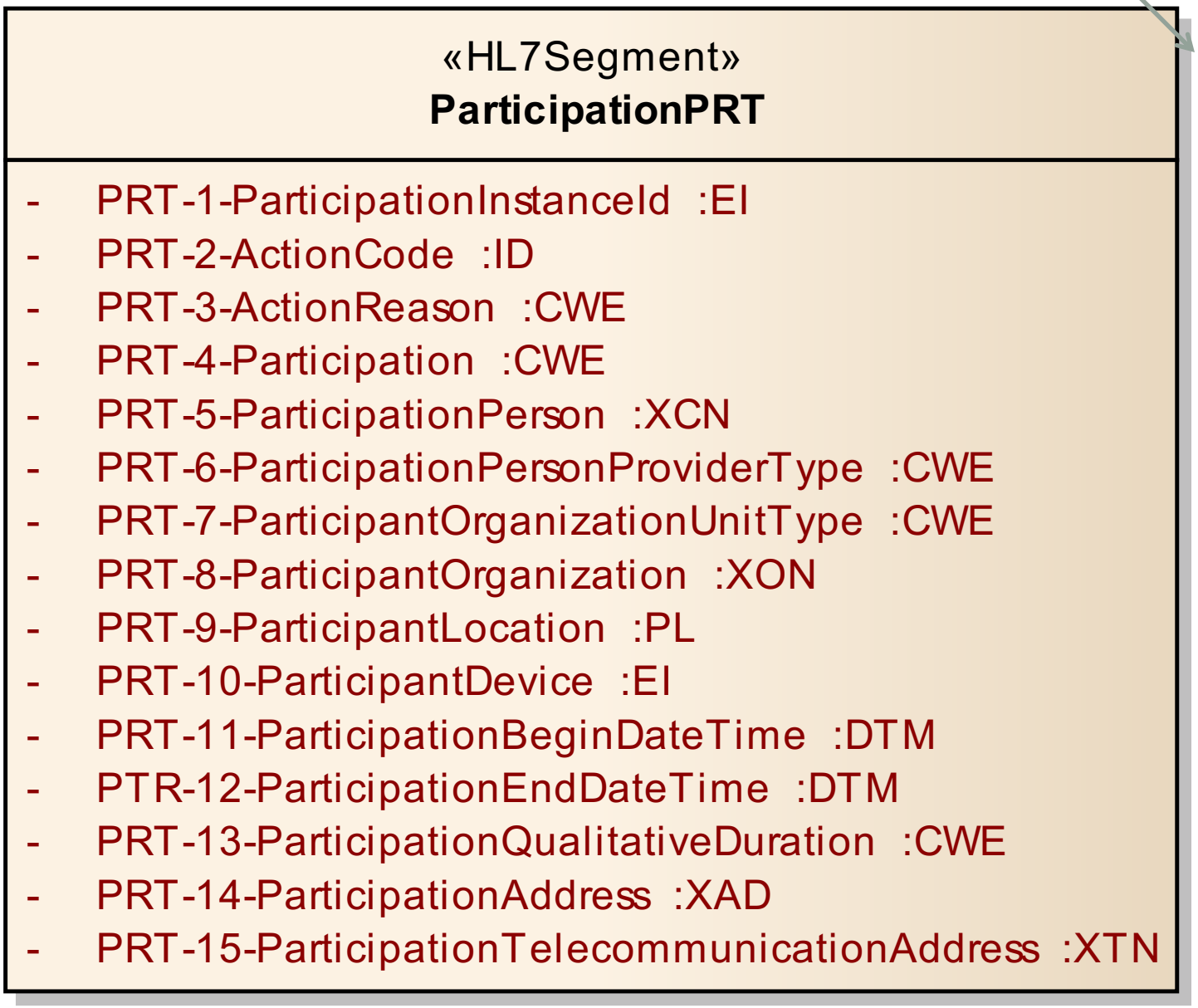


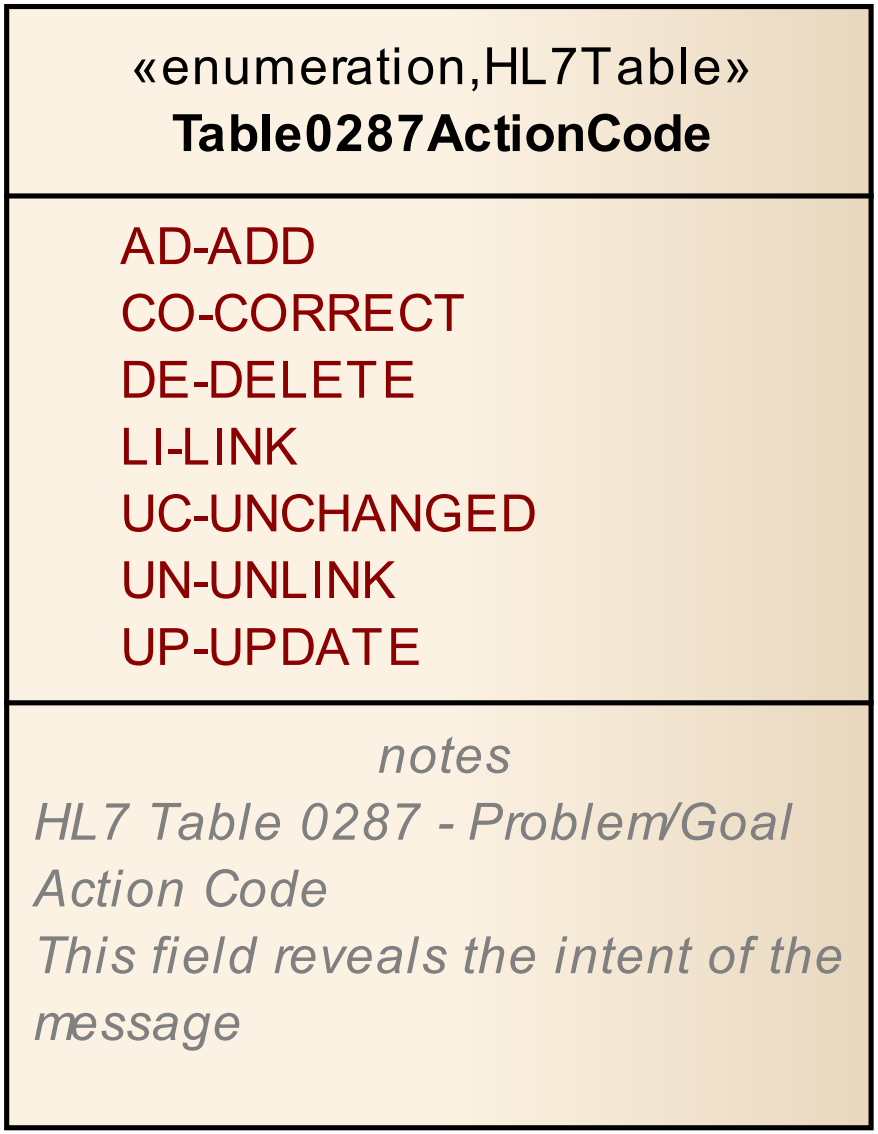
One workflow, part 2



DOING THIS IN HL7 V2

(2.7+, that is)


«HL7Segment»
ParticipationPRT
- PRT-1-ParticipationInstanceId :EI
- PRT-2-ActionCode :ID
- PRT-3-ActionReason :CWE
- PRT-4-Participation :CWE
- PRT-5-ParticipationPerson :XCN
- PRT-6-ParticipationPersonProviderType :CWE
- PRT-7-ParticipantOrganizationUnitType :CWE
- PRT-8-ParticipantOrganization :XON
- PRT-9-ParticipantLocation :PL
- PRT-10-ParticipantDevice :EI
- PRT-11-ParticipationBeginDateTime :DTM
- PTR-12-ParticipationEndDateTime :DTM
- PRT-13-ParticipationQualitativeDuration :CWE
- PRT-14-ParticipationAddress :XAD
- PRT-15-ParticipationTelecommunicationAddress :XTN


«enumeration,HL7Table»
Table0287ActionCode
AD-ADD
CO-CORRECT
DE-DELETE
LI-LINK
UC-UNCHANGED
UN-UNLINK
UP-UPDATE
notes
HL7 Table 0287 - Problem/Goal Action Code
This field reveals the intent of the message

“ANY-TO-ANY”

“Anyone can say anything about anything” -> flexibility about system roles responsibilities

Device identity

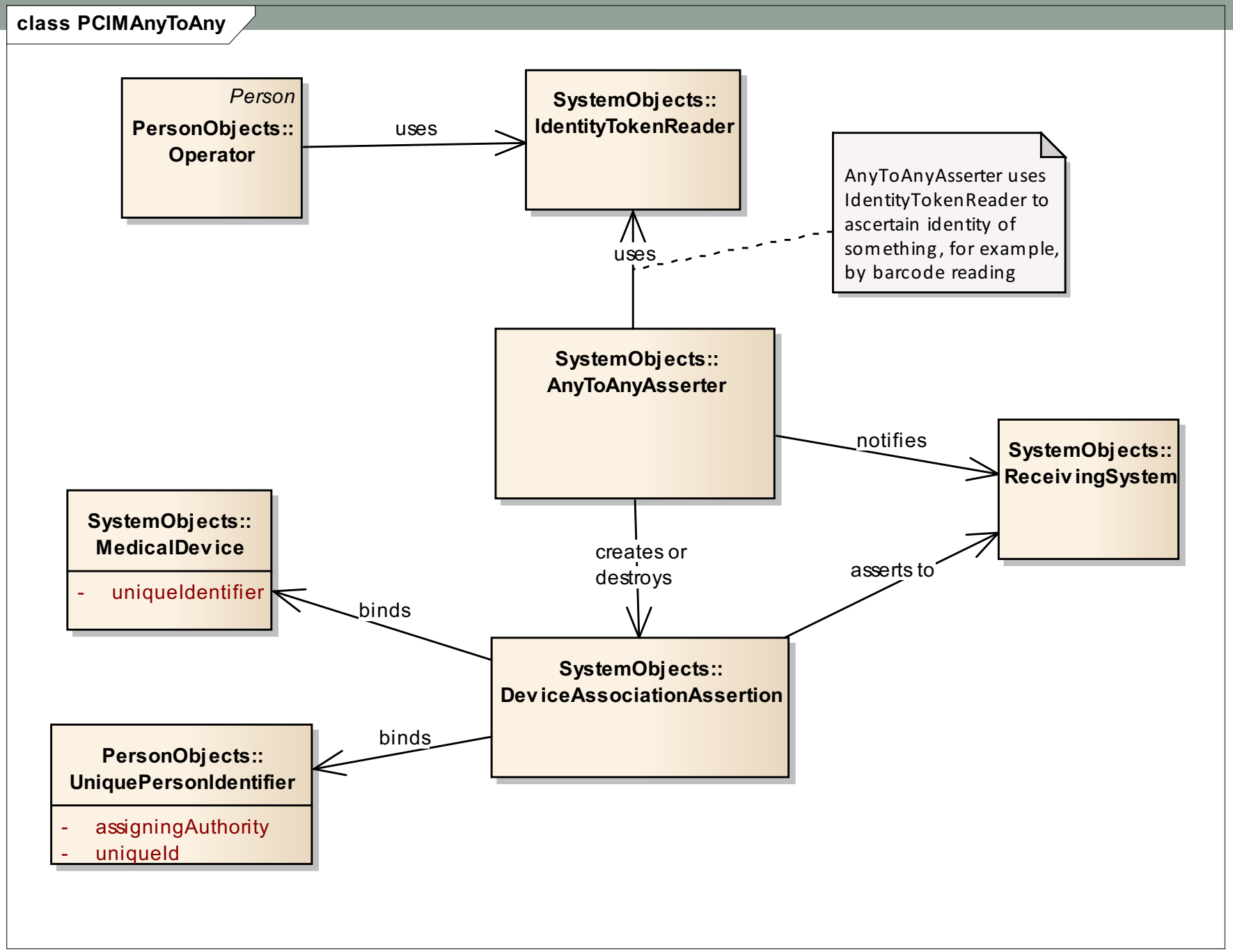
- EUI-64
- UDI Universal Device Identifier - Multiple possible schemes
  - GS1 GTIN Global Trade Item Number

What is UDI?

- **(01) 00614141999996(17)100101(10)123ABC(21)1234567890**
- **UDI = DI (Device Identifier) + PI (Production Identifier)**
  - On the Device Label
  - DI is lookup key for pulling out other attributes from GUDID
  - Computers can parse out lot, serial, expiration and manufacturer date (if available)

Semantic web principle

- “Anyone can say anything about anything”
- Supporting identity assertions from different systems in different topologies


class PCIMAnyToAny
Person
PersonObjects::
Operator
uses
SystemObjects::
IdentityTokenReader
AnyToAnyAsserter uses IdentityTokenReader to ascertain identity of something, for example, by barcode reading
uses
SystemObjects::
AnyToAnyAsserter
notifies
SystemObjects::
ReceivingSystem
SystemObjects::
MedicalDevice
- uniqueIdentifier
creates or destroys
asserts to
binds
SystemObjects::
DeviceAssociationAssertion
binds
PersonObjects::
UniquePersonIdentifier
- assigningAuthority
- uniqueId

Discussion?

- PCIM webex meeting Thursday 3 ET alternate weeks
- Thanks to: Robert Flanders (GE), Stan Wiley (Draeger)
- (Please) contribute more requirements, general insights, even if you can’t find it in your heart to come to any meetings

EXTRA SLIDES

Suggested Agenda

- Report from Robert
- Outreach
- Feedback from Epic (Chris Courville)
  - Use patient administration messages A04, A08, but open to Observation Reporting basis
- UDI implications
- Next actions

Look back over message structure options

- Rejected: Scheduling – poor match to semantics (Hans Buitendijk of Orders and Observations
- Register Patient (A04) Update (A08) – again, usage intent does not provide for PRT segments
- Observation Reporting (Unsolicited Observation ORU) – our previous choice)
  - Pro: provides for PRT segments, though conveying device information pretty far from apparent intent
  - Con: no existing HL7 spec or practice known to us provides a good template for us to use as basis