Integrating the Healthcare Enterprise

IHE Radiology
Technical Framework Supplement

Scheduled Workflow.b
(SWF.b)

Trial Implementation

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Foreword

This is a supplement to the IHE Radiology Technical Framework V13.0. Each supplement undergoes a process of public comment and trial implementation before being incorporated into the volumes of the Technical Frameworks.

This supplement is published on July 30, 2014 for trial implementation and may be available for testing at subsequent IHE Connectathons. The supplement may be amended based on the results of testing. Following successful testing it will be incorporated into the Radiology Technical Framework. Comments are invited and may be submitted at http://ihe.net/Radiology_Public_Comments.

This supplement describes changes to the existing technical framework documents.

"Boxed" instructions like the sample below indicate to the Volume Editor how to integrate the relevant section(s) into the relevant Technical Framework volume.

Amend section X.X by the following:

Where the amendment adds text, make the added text **bold underline**. Where the amendment removes text, make the removed text **~~bold strikethrough~~**. When entire new sections are added, introduce with editor's instructions to "add new text" or similar, which for readability are not bolded or underlined.

General information about IHE can be found at: www.ihe.net.

Information about the IHE Radiology domain can be found at: http://ihe.net/IHE_Domains.

Information about the organization of IHE Technical Frameworks and Supplements and the process used to create them can be found at: http://ihe.net/IHE_Process and http://ihe.net/Profiles.

The current version of the IHE Radiology Technical Framework can be found at: http://ihe.net/Technical_Frameworks.

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Introduction to this Supplement

The Scheduled Workflow.b Profile is introduced as a new variant of the Scheduled Workflow Profile. SWF.b makes support of HL7 v2.5.1 mandatory for the HL7 based transactions. HL7 v2.3 is not part of SWF.b. SWF.b also incorporates the transactions and functionality of the Patient Information Reconciliation (PIR) Profile into SWF.b. The original Scheduled Workflow Profile left PIR as a separate Profile.

The original SWF mandates support of HL7 V2.3 and provides a named option for additional support of HL7 v2.5.1. This supplement removes this named HL7 v2.5.1 Option. Systems that support both versions of HL7 may claim support for both SWF and SWF.b.

SWF.b is added to Volume 1 with essentially the same actors, scope and options as SWF. References in Volume 2 are updated.

This supplement modifies the current Final Text Technical Framework. Modifications related to TI Supplements (if any) will be handled separately.

Closed Issues

1	**Should Patient Information Reconciliation be folded into SWF.b?** A. Yes. The original split of SWF and PIR was just because it was too much to address all at once in the first year.
2	**What about pulling Report Manager into SWF.b (since it's in PIR)?** A. Leave it out of SWF.b for now Report Manager is in PIR to get reconciliation in RWF. RWF is an open topic (proposal to shift from GP-Worklist to UPS). When we deal with RWF we can either: A: Reference SWF.b (I don't remember what this meant) B: Incorporate PIR transactions into RWF.b as we did with SWF.b C: Add Report Manager to SWF.b D: Other In the meantime, Report Managers can still claim PIR till retired. (Not that many are doing RWF anyway).
3	**Should we add Option Summary sections to 34.2.2 for each existing option?** A. Yes. It resolves the issue that currently most options don't have a "shall trigger". But keep the Option sections simple.

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4	**How should we roll this supplement out?** For now, publish this supplement and retain SWF and PIR in the Technical Framework. Promote SWF.b and see what the uptake is in Connectathon. Collect feedback from IHE-J Connectathon too. Based on feedback, consider retiring SWF and/or PIR at a future date. The Cardiology/Eye Care/etc. documents currently reference the RAD-1,2,3… transactions in the current TF (not in this supplement) so by default they are not immediately affected since they don't reference the 2.5.1 option. To be perfectly clear they should add a line stating use of 2.3.1 Message Semantics. Cardiology doesn't really want to be pushed into 2.5.1 yet. Would prefer to coast for a bit. PAM would like to see further changes to factor out the PAM transactions from SWF.b and/or SWF. Input on this is encouraged. A recommendation on whether to stop offering testing of v2.3.1 at Connectathon should come from the IHE Radiology Planning Committee. If such a recommendation should be sent to Lynn by June 30.
5	**How do we handle the MIMA Option?** For now, no MIMA Option listed explicitly in the SWF.b Supplement. Deciding what the MIMA Semantics are for v2.5.1 should be a MIMA activity, not a SWF.b activity. Address folding MIMA into SWF.b based on the outcome of that analysis. In principle our goal is to preserve all SWF options in SWF.b so we would like to address MIMA. Currently MIMA does not address HL7 v2.5.1 and some of the MIMA edits conflict with the CP-213 edits. Since MIMA was based on RAD TF 2009, there may be other CPs to rationalize. A question was also raised about forwarding the Procedure Scheduled message. MIMA augments SWF and PIR separately using separate options with the same name. Presumably these two options and semantics would be merged when folding MIMA into SWF.b. The order/likelihood of MIMA and SWF.b going to Final Text and getting folded into the Technical Framework is unknown.

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General Introduction

Update the following Appendices to the General Introduction as indicated below. Note that these are not appendices to Volume 1.

Appendix A – Actor Summary Definitions

Add the following actors to the IHE Technical Frameworks General Introduction list of Actors:

None

Appendix B – Transaction Summary Definitions

Add the following transactions to the IHE Technical Frameworks General Introduction list of Transactions:

None

Glossary

Add the following glossary terms to the IHE Technical Frameworks General Introduction Glossary:

None

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Volume 1 – Profiles

Modify Section 2.1.1 to mention SWF.b. Whether the text is modified to replace SWF with SWF.b (if we retire SWF at that time) or mention both profiles, or mention SWF.b at the bottom of the list, will depend on what we have decided at that time.

See instruction above.

Add the following text below Table 3.1-1: Scheduled Workflow - Actors and Transactions (and below its note)

In each of the transactions assigned in Table 3.1-1, actors shall implement the HL7 v2.3.1 Message Semantics when such semantics are defined.

Modify Section 3.2 to remove the 2.5.1 Option from SWF as shown below.

3.2 Scheduled Workflow Integration Profile Options

Options that may be selected for this Integration Profile are listed in Table 3.2-1 along with the Actors to which they apply. Dependencies between options when applicable are specified in notes.

Table 3.2-1: Scheduled Workflow - Actors and Options

Actor	Option	Volume & Section
ADT Patient Registration	***No options defined*** ~~**HL7 v2.5.1**~~	~~**RAD TF-1:3.2.1**~~ ~~**RAD TF-2:4.1**~~ ~~**RAD TF-2:4.12**~~
Order Placer	Departmental Appointment Notification	RAD TF-3: 4.48
	~~**HL7 v2.5.1**~~	~~**RAD TF-1:3.2.1**~~ ~~**RAD TF-1:3.3.3.2**~~ ~~**RAD TF-2:4.1**~~ ~~**RAD TF-2:4.2**~~ ~~**RAD TF-2:4.3**~~ ~~**RAD TF:2.12**~~
DSS/Order Filler	Image Availability	RAD TF-2:4.11
	Departmental Appointment Notification	RAD TF-3:4.48
	PPS Exception Management	RAD TF-2:4.7
	Performed Work Status Update - Receive	RAD TF-2:4.42
	Availability of PPS-Referenced Instances	RAD TF-3:4.49

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Actor	Option	Volume & Section
	~~HL7 v2.5.1~~	~~RAD TF-1:3.2.1~~ ~~RAD TF-1:3.3.3.2~~ ~~RAD TF-2:4.1~~ ~~RAD TF-2:4.2~~ ~~RAD TF-2:4.3~~ ~~RAD TF-2:4.4~~ ~~RAD TF-2:4.12~~ ~~RAD TF-2:4.13~~
Acquisition Modality	Patient Based Worklist Query (note 1)	RAD TF-2:4.5
	Broad Worklist Query (note 1)	RAD TF-2:4.5
	Assisted Acquisition Protocol Setting	RAD TF-2:4.6
	PPS Exception Management	RAD TF-2:4.7
	Modality Group Case (note 2)	RAD TF-2:.4.6
	Billing and Material Management	RAD TF-2:4.7
Image Manager/ Image Archive	Availability of PPS-Referenced Instances	RAD TF-3:4.49
	PPS Exception Management	RAD TF-2:4.7
	Performed Work Status Update - Receive	RAD TF-2:4.42
	~~HL7 v2.5.1~~	~~RAD TF-1:3.2.1~~ ~~RAD TF-2:4.4~~ ~~RAD TF-2:4.13~~
Image Display	*No options defined*	-
Performed Procedure Step Manager	*No options defined*	-
Evidence Creator	Creator Performed Procedure Step	RAD TF-2:4.20 RAD TF-2:4.21
	PPS Exception Management (see note 3)	RAD TF-2:4.21

Note 1: At least one of these two options is required. Both may be supported.

Note 2: When a modality claims support for the Modality Group Case Option, it is required to support all three grouping scenarios described in RAD TF-2: 4.6.4.1.2.3.4.

Note 3: An Evidence Creator claiming the PPS Exception Management Option shall also support the Creator Performed Procedure Step Option.

The Evidence Creator, Acquisition Modality and Image Manager/ Image Archive will likely support a variety of DICOM SOP Classes. It is expected that this level of optionality will be documented by a reference in the IHE Integration Statement (see appendix D).

3.2.1 HL7 v2.5.1 Option

The HL7 v2.5.1 Option has been retired. Relevant systems may instead claim support for SWF.b. See RAD TF-1:34

~~**The HL7 v2.5.1 Option requires actors to support HL7 v2.5.1 in addition to HL7 v2.3.1 in the transactions referenced in Table 3.2-1. The actor shall permit configuration for each system that it communicates with using the referenced transactions whether HL7 v2.3.1 or**~~

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~~**HL7 v2.5.1 is used. It is possible that the actor may receive HL7 v2.3.1 messages and send HL7 v2.5.1 messages or vice versa.**~~

~~**The specifications in the HL7 v2.5.1 Option maintain semantic equivalency with HL7 v2.3.1 implementations and the field correspondences are summarized in RAD TF-2 Appendix E.**~~

Remove the (now) redundant reference to 2.3.1

3.3.3 Order Change Flow

~~3.3.3.1 Order Change Flow, HL7 v2.3.1~~

This case covers the situation when the Order Placer or the Department System Scheduler/Order Filler has to change order information or cancel/discontinue an order. When an order information change is necessary, for HL7 v2.3.1, the IHE Technical Framework requires the initiating actor to cancel the order and generate the new one using the new information. Figures 3.3-6 and 3.3-7 depict examples of order cancellation/re-ordering flow initiated by the Order Placer and the Department System Scheduler/Order Filler respectively. Note that one should consider these transactions as being performed between the process flow fragments depicted in Figures 3.3-1 and 3.3-2 to ensure synchronization of information between interested actors.

Remove the (now) redundant Section 3.3.3.2 and its text

~~3.3.3.2 Change Order Flow, HL7 v2.5.1 Option~~

~~…~~

Modify Section 4.2 to remove the 2.5.1 Option from PIR as shown below.

4.2 Patient Information Reconciliation Integration Profile Options

Options that may be selected for this Integration Profile are listed in the Table 4.2-1 along with the actors to which they apply.

Table 4.2-1: Patient Information Reconciliation – Actors and Options

Actor	Options	Volume & Section
ADT Patient Registration	~~***No options defined***~~ ~~**HL7 v2.5.1**~~	~~**RAD TF-1:4.2.1**~~ ~~**RAD TF-2:4.12**~~
Order Placer	~~***No options defined***~~ ~~**HL7 v2.5.1**~~	~~**RAD TF-1:4.2.1**~~ ~~**RAD TF-2:4.12**~~

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Actor	Options	Volume & Section
DSS/Order Filler	***No options defined*** ~~**HL7 v2.5.1**~~	~~**RAD TF-1:4.2.1**~~ ~~**RAD TF-2:4.12**~~ ~~**RAD TF-2:4.13**~~
Acquisition Modality	*No options defined*	-
Image Manager/ Image Archive	***No options defined*** ~~**HL7 v2.5.1**~~	~~**RAD TF-1:4.2.1**~~ ~~**RAD TF-2:4.12**~~ ~~**RAD TF-2:4.13**~~
MPPS Manager	*No options defined*	-
Report Manager	***No options defined*** ~~**HL7 v2.5.1**~~	~~**RAD TF-1:4.2.1**~~ ~~**RAD TF-2:4.12**~~ ~~**RAD TF-2:4.13**~~

4.2.1 HL7 v2.5.1 Option

The HL7 v2.5.1 Option has been retired. Relevant systems may instead claim support for SWF.b. See RAD TF-1:34.

~~**The HL7 v2.5.1 Option requires actors to support HL7 v2.5.1 in addition to HL7 v2.3.1 in the transactions referenced in Table 4.2-1. The actor shall permit configuration for each system that it communicates with using the referenced transactions whether HL7 v2.3.1 or HL7 v2.5.1 is used. It is possible that the actor may receive HL7 v2.3.1 messages and send HL7 v2.5.1 messages or vice versa.**~~

~~**The specifications in the HL7 v2.5.1 Option maintain semantic equivalency with HL7 v2.3.1 implementations and the field correspondences are summarized in RAD TF-2 Appendix E.**~~

Modify Section 13.2 to remove the 2.5.1 Option from RWF as shown below.

13.2 Reporting Workflow Integration Profile Options

Options that may be selected for this Integration Profile are listed in the Table 13.2-1 along with the Actors to which they apply. Dependencies between options when applicable are specified in notes.

Table 13.2-1: Reporting Workflow - Actors and Options

Actor	Options	Vol. & Section

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Actor	Options	Vol. & Section
Department System Scheduler / Order Filler	HL7 v2.5.1	RAD TF-1:13.2.1 RAD TF-2:4.4**.1.2.2** RAD TF-2:4.13**.4.2**
Image Manager/ Image Archive	*No options defined*	-
Report Creator	*No options defined*	-
Report Manager	HL7 v2.5.1	RAD TF-1:13.2.1 RAD TF-2:4.4**.1.2.2** RAD TF-2:4.13**.4.2**
Report Reader	*No options defined*	-
Performed Procedure Step Manager	*No options defined*	

13.2.1 HL7 v2.5.1 Option

The HL7 v2.5.1 Option requires actors to support HL7 v2.5.1 in addition to HL7 v2.3.1 in the transactions referenced in Table 13.2-1. The actor shall permit configuration for each system that it communicates with using the referenced transactions whether HL7 v2.3.1 or HL7 v2.5.1 is used. It is possible that the actor may receive HL7 v2.3.1 messages and send HL7 v2.5.1 messages or vice versa.

- **A Department System Scheduler / Order Filler that supports the HL7 v2.5.1 Option shall support the HL7 v2.5.1 Message Semantics for [RAD-4] and [RAD-13] in RAD TF-2:4.4.1.2.2 and RAD TF-2:4.13.4.2.**
- **A Report Manager that supports the HL7 v2.5.1 Option shall support the HL7 v2.5.1 Message Semantics for [RAD-4] and [RAD-13] in RAD TF-2:4.4.1.2.2 and RAD TF-2:4.13.4.2.**

The specifications in the HL7 v2.5.1 Option maintain semantic equivalency with HL7 v2.3.1 implementations and the field correspondences are summarized in RAD TF-2 Appendix E.

Add a new Profile Chapter/Section for Scheduled Workflow.b as shown below.

34 Scheduled Workflow.b (SWF.b) Profile

The ***Scheduled Workflow.b Integration Profile*** establishes the continuity and integrity of basic departmental imaging data. It maintains the consistency of patient and ordering information as well as providing the scheduling and imaging acquisition procedure steps. This profile makes it possible to determine whether images and other evidence objects associated with a particular performed procedure step have been stored (archived) and are available to enable subsequent workflow steps, such as reporting. It may also provide central coordination of the completion of processing and reporting steps as well as notification of appointments to the Order Placer.

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This Profile also offers the means to match images, diagnostic reports, and other evidence objects acquired for a misidentified or unidentified patient (for example, during a trauma case) with the patient's record. In the example of the trauma case, this integration profile allows subsequent reconciliation of the patient record with images that are acquired (either without a prior registration or under a generic registration) before the patient's identity can be determined. Thus images can be acquired and interpreted immediately and later, when the patient's official registration and order information is entered into the ADT, Order Placer and Order Filler Systems, this information is matched with the acquired image set and reports, greatly simplifying these exception handling situations.

34.1 SWF.b Actors and Transactions

This section defines the actors and transactions in this profile. General definitions of actors are given in the Technical Frameworks General Introduction Appendix A at http://ihe.net/Technical_Frameworks.

Figure 34.1-1 shows the actors directly involved in the SWF.b Profile and the relevant transactions between them. If needed for context, other actors that may be indirectly involved due to their participation in other related profiles are shown in dotted lines. Actors which have a mandatory grouping are shown in conjoined boxes.

Note: In an attempt to simplify Figure 34.1-1, not all of the "optional" transactions listed in Table 34.1-1 are shown in the diagram.

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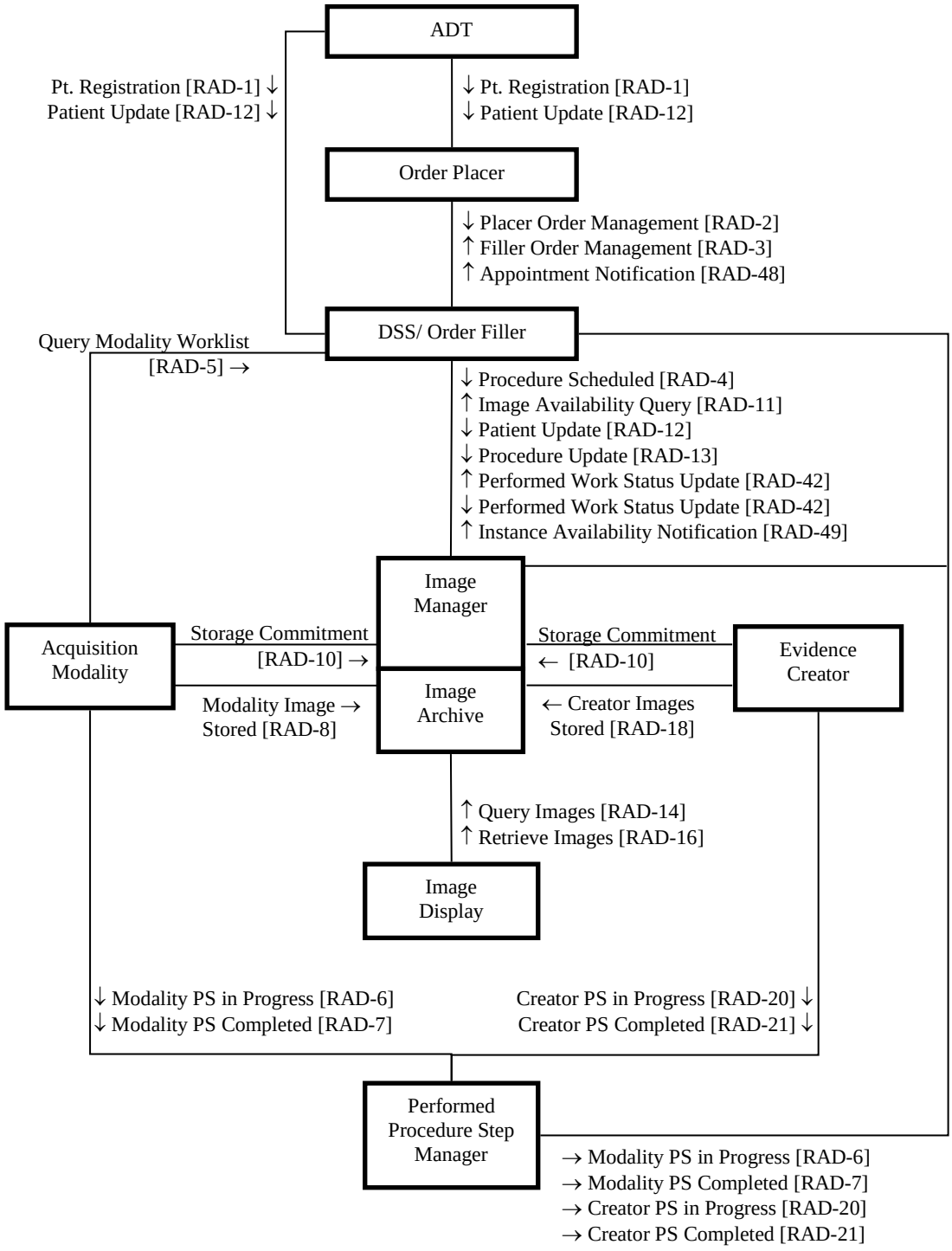

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Figure 34.1-1: Scheduled Workflow.b Actor Diagram

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Table 34.1-1 lists the transactions for each actor directly involved in the Scheduled Workflow.b Profile. To claim compliance with this Profile, an actor shall support all required transactions (labeled "R") and may support the optional transactions (labeled "O").

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Table 34.1-1: SWF.b Profile - Actors and Transactions

Actors	Transactions	Optionality	Reference
ADT Patient Registration	Patient Registration [RAD-1]	R	RAD TF-2: 4.1
	Patient Update [RAD-12]	R	RAD TF-2: 4.12
Order Placer	Patient Registration [RAD-1]	R	RAD TF-2: 4.1
	Patient Update [RAD-12]	R	RAD TF-2: 4.12
	Placer Order Management [RAD-2]	R	RAD TF-2: 4.2
	Filler Order Management [RAD-3]	R	RAD TF-2: 4.3
	Appointment Notification [RAD-48]	O	RAD TF-2: 4.48
Department System Scheduler/ Order Filler	Patient Registration [RAD-1]	R	RAD TF-2: 4.1
	Patient Update [RAD-12]	R	RAD TF-2: 4.12
	Placer Order Management [RAD-2]	R	RAD TF-2: 4.2
	Filler Order Management [RAD-3]	R	RAD TF-2: 4.3
	Procedure Scheduled [RAD-4]	R	RAD TF-2: 4.4
	Query Modality Worklist [RAD-5]	R	RAD TF-2: 4.5
	Modality Procedure Step In Progress [RAD-6]	R	RAD TF-2: 4.6
	Modality Procedure Step Completed [RAD-7]	R	RAD TF-2: 4.7
	Images Availability Query [RAD-11]	O	RAD TF-2: 4.11
	Procedure Update [RAD-13]	R	RAD TF-2: 4.13
	Creator Procedure Step in Progress [RAD-20]	R	RAD TF-2: 4.20
	Creator Procedure Step Completed [RAD-21]	R	RAD TF-2: 4.21
	Performed Work Status Update [RAD-42] (as the Receiver, see Note 1))	O	RAD TF-2: 4.42
	Appointment Notification [RAD-48]	O	RAD TF-2: 4.48
	Instance Availability Notification [RAD-49]	O	RAD TF-2: 4.49
Acquisition Modality	Query Modality Worklist [RAD-5]	R	RAD TF-2: 4.5
	Modality Procedure Step In Progress [RAD-6]	R	RAD TF-2: 4.6
	Modality Procedure Step Completed [RAD-7]	R	RAD TF-2: 4.7
	Modality Images Stored [RAD-8]	R	RAD TF-2: 4.8
	Storage Commitment [RAD-10]	R	RAD TF-2: 4.10
Image Manager/ Image Archive	Procedure Scheduled [RAD-4]	R	RAD TF-2: 4.4
	Modality Procedure Step In Progress [RAD-6]	R	RAD TF-2: 4.6
	Modality Procedure Step Completed [RAD-7]	R	RAD TF-2: 4.7
	Modality Images Stored [RAD-8]	R	RAD TF-2: 4.8
	Storage Commitment [RAD-10]	R	RAD TF-2: 4.10
	Images Availability Query [RAD-11]	R	RAD TF-2: 4.11

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Actors	Transactions	Optionality	Reference
	Patient Update [RAD-12]	R	RAD TF-2: 4.12
	Procedure Update [RAD-13]	R	RAD TF-2: 4.13
	Query Images [RAD-14]	R	RAD TF-2: 4.14
	Retrieve Images [RAD-16]	R	RAD TF-2: 4.16
	Creator Images Stored [RAD-18]	R	RAD TF-2: 4.18
	Creator Procedure Step in Progress [RAD-20]	R	RAD TF-2: 4.20
	Creator Procedure Step Completed [RAD-21]	R	RAD TF-2: 4.21
	Performed Work Status Update [RAD-42] (as the Receiver, see Note 1)	O	RAD TF-2: 4.42
	Instance Availability Notification [RAD-49]	O	RAD TF-2: 4.49
Performed Procedure Step Manager	Modality Procedure Step In Progress [RAD-6]	R	RAD TF-2: 4.6
	Modality Procedure Step Completed [RAD-7]	R	RAD TF-2: 4.7
	Creator Procedure Step in Progress [RAD-20]	R	RAD TF-2: 4.20
	Creator Procedure Step Completed [RAD-21]	R	RAD TF-2: 4.21
Image Display	Query Images [RAD-14]	R	RAD TF-2: 4.14
	Retrieve Images [RAD-16]	R	RAD TF-2: 4.16
Evidence Creator	Creator Images Stored [RAD-18]	R	RAD TF-2: 4.18
	Creator Procedure Step in Progress [RAD-20]	O	RAD TF-2: 4.20
	Creator Procedure Step Completed [RAD-21]	O	RAD TF-2: 4.21
	Storage Commitment [RAD-10]	R	RAD TF-2: 4.10

Note 1: The Department System Scheduler or the Image Manger may optionally choose to be receivers of Performed Work Status Update transactions in order to monitor the status of work in workflows that are managed by other systems (see RAD TF-3: 4.42).

34.1.1 Actor Descriptions and Actor Profile Requirements

Most requirements are documented in Transactions (Volumes 2 & 3). This section documents any additional requirements on the profile's actors.

34.1.1.1 ADT Patient Registration

In each of the transactions assigned in Table 34.1-1, the ADT Patient Registration Actor shall implement the HL7 v2.5.1 Message Semantics when such semantics are defined.

Note: The HL7 v2.5.1 message semantics maintain semantic equivalency with the HL7 v2.3.1 message semantics and the field correspondences are summarized in RAD TF-2 Appendix E.

34.1.1.2 Order Placer

In each of the transactions assigned in Table 34.1-1, the Order Placer Actor shall implement the HL7 v2.5.1 Message Semantics when such semantics are defined.

Note: The HL7 v2.5.1 message semantics maintain semantic equivalency with the HL7 v2.3.1 message semantics and the field correspondences are summarized in RAD TF-2 Appendix E.

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34.1.1.3 Order Filler

In each of the transactions assigned in Table 34.1-1, the Order Filler Actor shall implement the HL7 v2.5.1 Message Semantics when such semantics are defined.

Note: The HL7 v2.5.1 message semantics maintain semantic equivalency with the HL7 v2.3.1 message semantics and the field correspondences are summarized in RAD TF-2 Appendix E.

34.1.1.4 Image Manager/Image Archive

In each of the transactions assigned in Table 34.1-1, the Image Manager/Image Archive Actor shall implement the HL7 v2.5.1 Message Semantics when such semantics are defined.

Note: The HL7 v2.5.1 message semantics maintain semantic equivalency with the HL7 v2.3.1 message semantics and the field correspondences are summarized in RAD TF-2 Appendix E.

34.1.1.5 Performed Procedure Step Manager

The Performed Procedure Step Manager (which is grouped with both Order Fillers and Image Manager/Image Archives) shall be capable of being disabled via configuration. This avoids having two active PPS Managers creating confusion or forwarding loops.

34.2 SWF.b Actor Options

Options that may be selected for each actor in this Profile, if any, are listed in Table 34.2-1. Dependencies between options when applicable are specified in notes.

Table 34.2-1: Scheduled Workflow.b - Actors and Options

Actor	Option Name	Reference
ADT Patient Registration	*No options defined*	
Order Placer	Departmental Appointment Notification Option	RAD TF-1:34.2.1 RAD TF-1:34.4.2.7 RAD TF-3: 4.48
DSS/Order Filler	Image Availability Option	RAD TF-1:34.2.2 RAD TF-2:4.11
	Departmental Appointment Notification Option	RAD TF-1:34.2.1 RAD TF-1:34.4.2.7 RAD TF-3:4.48
	PPS Exception Management Option	RAD TF-1:34.2.3 RAD TF-2:4.7.4.1.2.2 RAD TF-2:4.7.4.1.3.1 RAD TF-2:4.21.4.1.2.1
	Performed Work Status Update - Receive Option	RAD TF-1:34.2.9 RAD TF-3:4.42
	Availability of PPS-Referenced Instances Option	RAD TF-1:34.2.8 RAD TF-3:4.49

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Actor	Option Name	Reference
	Billing and Material Management Option	RAD TF-1:34.2.6 RAD TF-2:4.7.4.1.3.2
Acquisition Modality	Patient Based Worklist Query Option (note 1)	RAD TF-2:4.5
	Broad Worklist Query Option (note 1)	RAD TF-2:4.5
	Assisted Acquisition Protocol Setting Option	RAD TF-1:34.2.5 RAD TF-2:4.5.4.2.3 RAD TF-2:4.6.4.1.2.4 RAD TF-2:A.1
	PPS Exception Management Option	RAD TF-1:34.2.3 RAD TF-2:4.7.4.1.2.2 RAD TF-2:4.7.4.1.3.1 RAD TF-2:4.7.4.1.2.2
	Modality Group Case Option	RAD TF-1:34.2.4 RAD TF-2:.4.6
	Billing and Material Management Option	RAD TF-1:34.2.6 RAD TF-2:4.7.4.1.2.3
Image Manager/ Image Archive	Availability of PPS-Referenced Instances Option	RAD TF-1:34.2.8 RAD TF-3:4.49
	PPS Exception Management Option	RAD TF-1:34.2.3 RAD TF-2:4.7.4.1.2.2 RAD TF-2:4.7.4.1.3.1 RAD TF-2:4.21.4.1.2.1
	Performed Work Status Update - Receive Option	RAD TF-1:34.2.9 RAD TF-3:4.42
Image Display	*No options defined*	-
Performed Procedure Step Manager	*No options defined*	-
Evidence Creator	Creator Performed Procedure Step Option	RAD TF-1:34.2.7 RAD TF-2:4.20 RAD TF-2:4.21
	PPS Exception Management Option (see note 2)	RAD TF-1:34.2.3 RAD TF-2:4.21.4.1.2.1

Note 1: At least one of these two options is required. Both may be supported.

Note 2: An Evidence Creator claiming the PPS Exception Management Option shall also support the Creator Performed Procedure Step Option.

The Evidence Creator, Acquisition Modality and Image Manager/ Image Archive will likely support a variety of DICOM SOP Classes. It is expected that this level of optionality will be documented by a reference in the IHE Integration Statement (see Appendix D).

34.2.1 Departmental Appointment Notification Option

This option involves the Order Filler notifying the Order Placer when imaging procedures are newly scheduled, rescheduled or canceled on the Order Filler.

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Order Filler Actors and Order Placer Actors that claim this option shall support the Appointment Notification [RAD-48] transaction and the use case and process flow described in RAD TF-1:34.4.2.7.

Order Fillers that claim this option shall have ability to be configured so that the Appointment Notification transaction is not sent when connected to an Order Placer that does not support the Departmental Appointment Notification Option.

34.2.2 Image Availability Option

This option involves the Order Filler checking on the availability of images generated during acquisitions.

Order Filler Actors that claim this option shall support the Images Availability Query [RAD-11] transaction.

34.2.3 PPS Exception Management Option

This option involves using PPS message features to communicate and handle advanced exception cases.

Acquisition Modality Actors, Evidence Creator Actors, Image Manager Actors and Order Filler Actors that claim this option shall support the use case and process flow described in RAD TF-1:34.4.2.5.

34.2.4 Modality Group Case Option

This option involves the Acquisition Modality combining multiple Scheduled Procedure Steps and performing them in a procedure described by a single Performed Procedure Step.

Acquisition Modality Actors that claim this option shall support all three grouping scenarios described in RAD TF-2: 4.6.4.1.2.3.4.

34.2.5 Assisted Acquisition Protocol Setting Option

This option involves the Acquisition Modality using procedure codes provided in the modality worklist to automatically assist the operator in selecting and setting the acquisition protocol.

See RAD TF-2:4.6.4.1.2.4.2 for more details.

34.2.6 Billing and Material Management Option

This option involves using PPS message features to communicate details related to billing and materials consumed during the procedure from the Acquisition Modality to the Order Filler.

See RAD TF-2:4.7.4.1.2.3 for more details.

34.2.7 Creator Performed Procedure Step Option

This option involves the Evidence Creator using PPS messages to keep the PPS Manager informed about steps performed on the Evidence Creator.

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Evidence Creator Actors that claim this option shall support the Creator Procedure Step in Progress [RAD-20] transaction and the Creator Procedure Step Completed [RAD-21] transaction.

34.2.8 Availability of PPS-Referenced Instances Option

This option involves Image Manager/Archives notifying relevant actors of the availability status of newly stored DICOM objects.

Image Manager/Archive Actors and Order Filler Actors that claim this option shall support the Instance Availability Notification [RAD-49] transaction.

34.2.9 Performed Work Status Update – Receive Option

This option involves Order Fillers and Image Mangers monitoring the status of work in workflows that are managed by other systems.

Image Manager/Archive Actors and Order Filler Actors that claim this option shall support the Performed Work Status Update [RAD-42] transaction as an SCP (to receive such updates).

Other profiles such as Charge Posting (CHG), Post-Processing Workflow (PWF) and Reporting Workflow (RWF) require actors such as the Order Filler, Post-Processing Manager and Report Manager to support the transactions as an SCU (to send such updates).

34.3 SWF.b Required Actor Groupings

An actor from this profile (Column 1) shall implement all of the required transactions and/or content modules in this profile in addition to all of the transactions required for the grouped actor (column 2).

Section 34.5 may describe some optional groupings that may be of interest for security considerations and Section 34.6 describes some optional groupings in other related profiles.

Table 34.3-1: Scheduled Workflow.b - Required Actor Groupings

SWF.b Actor	Actor to be grouped with	Reference	Content Bindings Reference
ADT Patient Registration	None	--	--
Order Placer	None	--	--
DSS/Order Filler	RAD Scheduled Workflow.b - Performed Procedure Step Manager	RAD TF-1: 34.1	--
Acquisition Modality	None	--	--
Image Manager	RAD Scheduled Workflow.b - Image Archive	RAD TF-1: 34.1	--

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SWF.b Actor	Actor to be grouped with	Reference	Content Bindings Reference
	RAD Scheduled Workflow.b - Performed Procedure Step Manager	RAD TF-1: 34.1	--
Image Archive	RAD Scheduled Workflow.b - Image Manager	RAD TF-1: 34.1	--
Image Display	None	--	--
Performed Procedure Step Manager	None	--	--
Evidence Creator	None	--	--

34.4 SWF.b Overview

The primary features of the Scheduled Workflow.b Profile are:

- Patient management
- Order management
- Bridging HL7 orders into DICOM worklists
- Acquisition of DICOM data with proper structure and identifiers
- Handling routine exceptions (such as emergency procedures that are performed before they are formally ordered, or procedures where the identity of the patient is unknown or mis-selected)

34.4.1 Concepts

This section defines the integrated data model adopted by the IHE Technical Framework for the HL7 messages and the DICOM Information Object Definitions (IODs). The Entity Relationship (ER) diagram represents the integration of proper subsets of HL7 2.5.1 and the DICOM Model of the Real World with minor extensions as noted in the following section and described in Appendix B.

34.4.1.1 Model of the Real World

Figure 34.4.1.1-1 depicts the model of the real world within scope of the Scheduled Workflow.b Profile. This model provides an overview of the high-level integration of the DICOM and HL7 models. This integrated model differs from the DICOM Model of the Real World (refer to DICOM 2011 PS 3.3) in the following respects:

- The Service Episode, Procedure Plan and Procedure Type entities have been excluded and are outside the scope of the IHE Technical Framework

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- The relationship between the Visit and Imaging Service Request has been excluded and is outside the scope of the IHE Technical Framework.
- The HL7 Placer Order and Filler Order entities have been inserted into the DICOM hierarchy between the Patient entity and Imaging Service Request entity. IHE requires that a single Placer Order shall correspond to one and only one Filler Order.
- The DICOM Imaging Service Request Entity is equated with the HL7 Filler Order entity. In this relationship, IHE provides clarification of the use of the Accession Number - DICOM attribute (0008,0050); see appendix A for further discussion.

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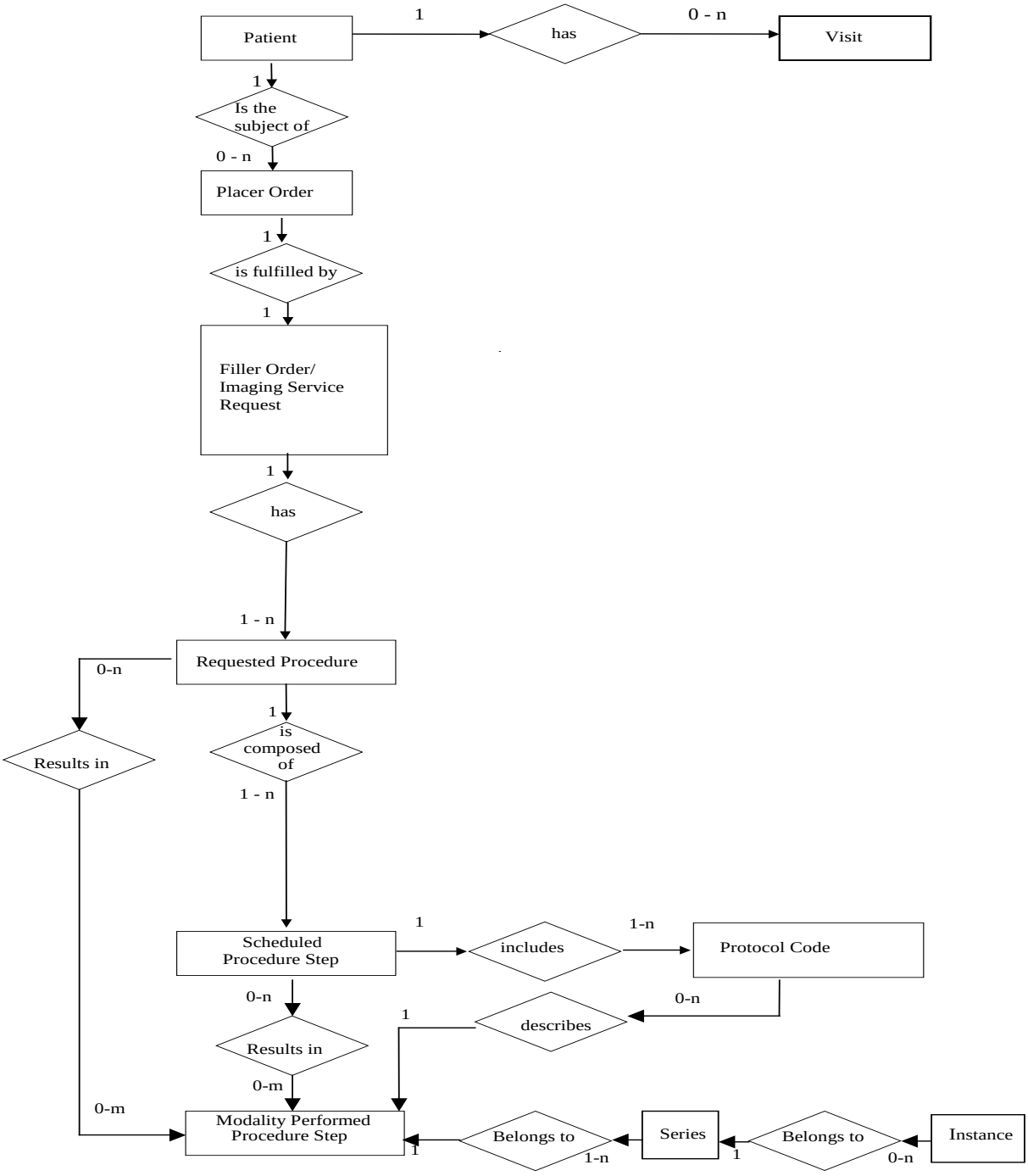

Figure 34.4.1.1-1: Real World Model for Scheduled Workflow

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34.4.1.2 Scheduled Workflow Concepts in Practice

The IHE "Real World" model for Scheduled Workflow described above offers three major levels of control that can be used to customize a broad range of specific workflow situations:

Order: A request for an Imaging Service

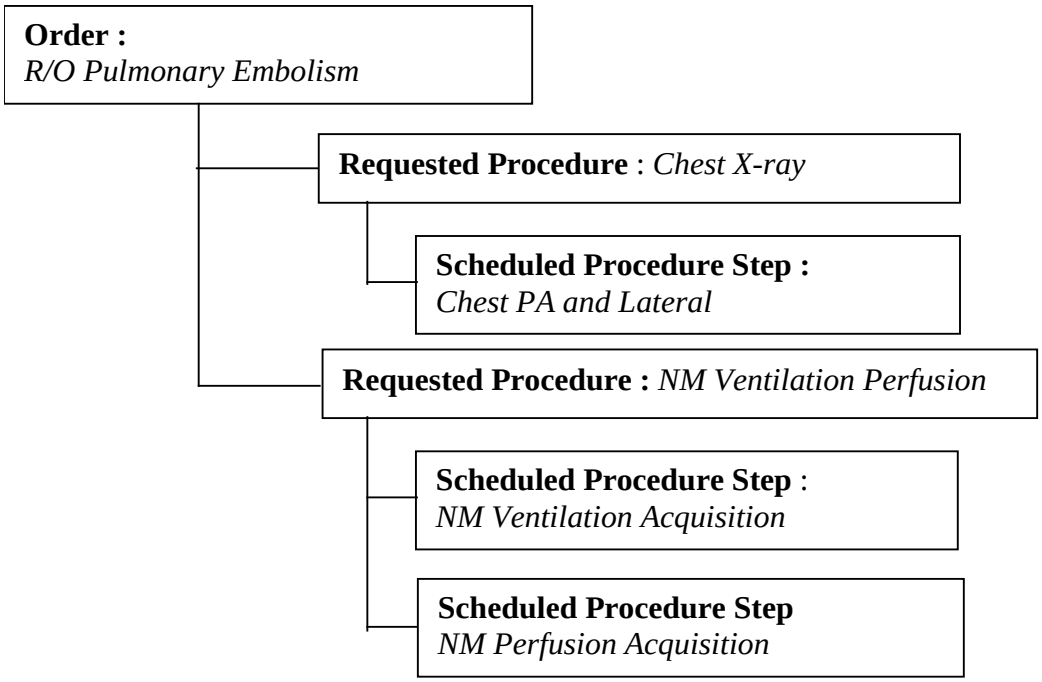
Requested Procedure: Unit of work resulting in one report with associated codified, billable acts.

Scheduled and Performed Procedure Step: the smallest unit of work in the workflow that is scheduled (work to do) and/or performed (work done).

The Order Filler/Department System Scheduler uses the Universal Service ID in each order that it receives to determine what specific Requested Procedures are needed, and for each Requested Procedure the Procedure Steps that need to be scheduled.

A departmental Procedure Plan may be used in the Order Filler Actor to predefine for each one of the types of Orders that may be requested from the imaging department (generally defined in the Order Placer) the breakdown in Requested Procedure (with a specific procedure code) and for each Requested Procedure Code, the breakdown in Scheduled Procedure Steps.

The figure below defines an example of the breakdown of a "rule out pulmonary embolism" Order.



In this Procedure Plan, for this specific Order, two Requested Procedures are defined. The Chest X-ray that will be read and reported by a different radiologist than the NM Ventilation-Perfusion, hence two different Requested Procedures. The NM Ventilation Perfusion Procedure has been scheduled as two different Scheduled Procedure Steps, to account for the fact that the patient will have the two NM acquisitions performed at a different time, thus allowing for patient preparation

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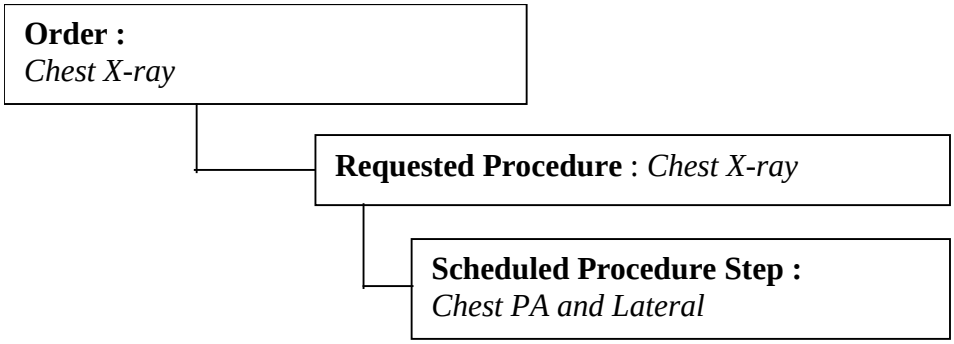
between the two examinations. This is the way this institution has decided to handle this Order. Another Institution may choose to require the same radiologist to read both the X-ray and the NM images. In that case it would define in its Procedure plan for the same Order to have a single Requested Procedure with three Scheduled Procedure Steps.

Many Orders processed in a Radiology Department would have a simpler breakdown such as this Chest X-ray example.



It should be noted that the three level Order breakdown has been defined in IHE Scheduled Workflow.b so that any type of Orders, from the simple case to the more complex cases may be handled by the same workflow concepts, thus providing a general approach that can be easily customized by each imaging department in the definition of its Procedure Plan.

In IHE Scheduled Workflow.b, the **Accession Number identifies the Order**. The requested Procedure ID distinguishes among Requested Procedures when an Order requires multiple Procedures. IHE sets a common meaning for these two terms to provide clinicians with a consistent and non-ambiguous access across different vendor products (RIS, PACS and Modalities).

34.4.1.2.1 Tracking Performed Procedure Steps

IHE Scheduled Workflow.b not only addresses the breakdown of Orders into Requested Procedures and Scheduled Procedure Steps but also allows tracking the Procedure Steps that have actually been performed. The Performed Procedure Steps may or may not correspond to the Scheduled Procedure Steps. This provides the flexibility needed to adjust on the Modality if the actual acquisition differs from what was scheduled.

Using the Pulmonary Embolism example above, one may decide to follow the Order breakdown as defined in the procedure Plan.

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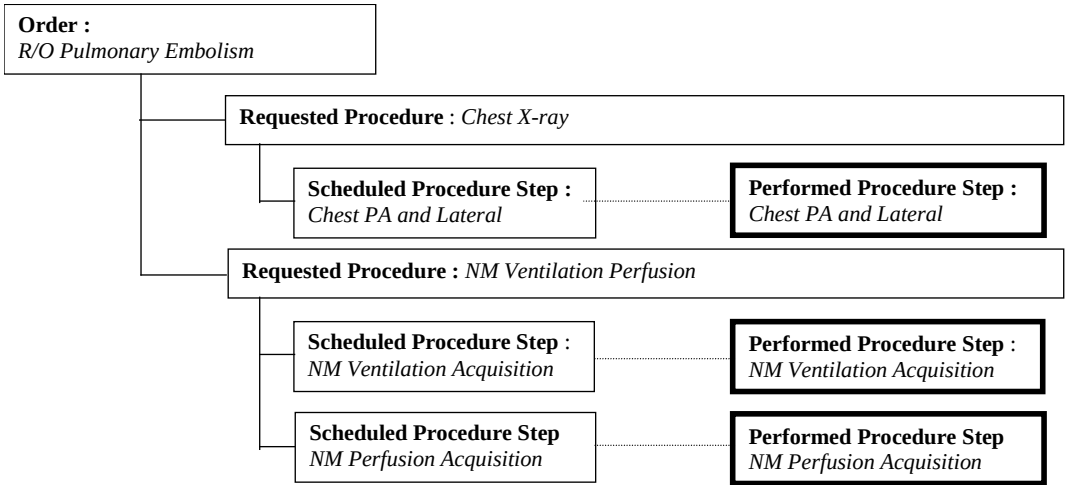
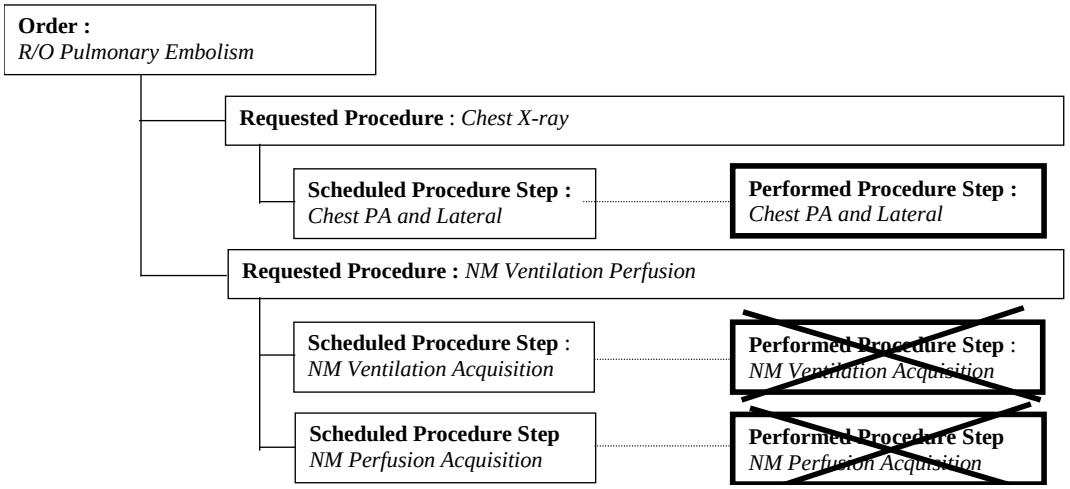


The Chest X-ray Requested Procedure would contain the series of images associated with the Chest PA and Lateral Performed Procedure and the NM Ventilation Perfusion would contain both the series for the ventilation and the series of images for the perfusion. From this example one can see how the Requested Procedure forms the "folder" where the radiologists find the images to be read resulting from the Scheduled Procedures Steps.

Using the Pulmonary Embolism example above, one may decide that following the Chest X-ray, it is not necessary to perform the NM Perfusion Ventilation.



In this later case, the Nuclear Scheduled Procedure Steps will be cancelled. Only the Chest X-ray Requested Procedure will "contain" the Image corresponding to the Chest PA and lateral Chest X-ray.

To illustrate further the capabilities of IHE Scheduled Workflow.b, let's look at a Chest/Abdomen/Pelvis Order that a radiology department chooses to break down into a Chest Requested Procedure and an Abdomen/Pelvis Requested Procedure in order to take advantage of the subspecialties of its radiologists. Some hospitals also may want to produce separate reports to align with the charging policies.

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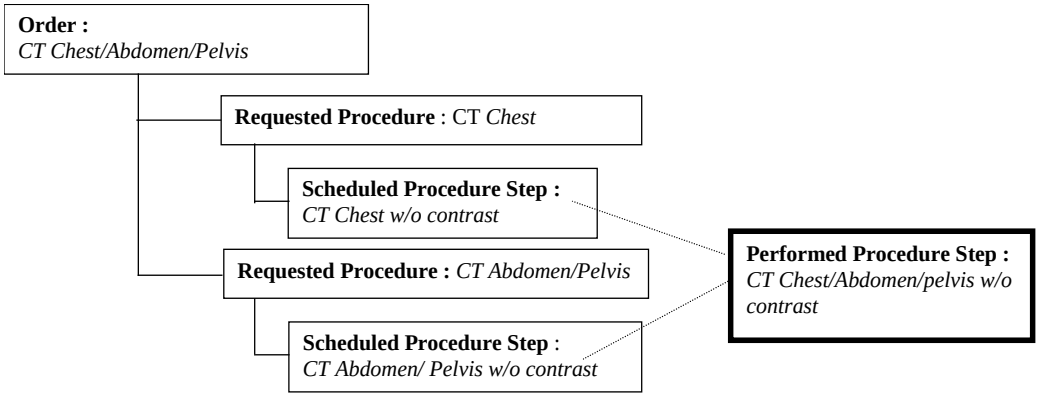
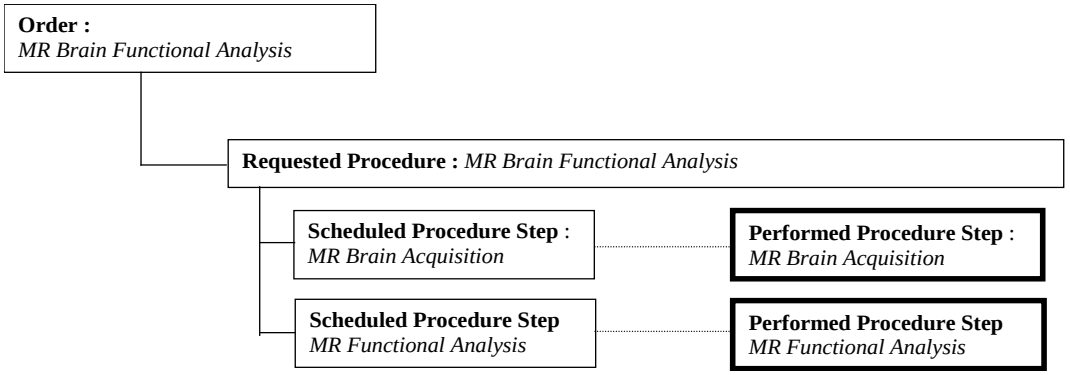


In this example, a single Performed Procedure Step has been performed in response to two Scheduled Procedure Steps. IHE refers to this as a Group Case (see RAD-TF2: 4.6). At the time of reading, the same series of images produced by this Performed Procedure Step would be read once in the context of the CT Chest Requested Procedure and again in the context of the Abdomen/Pelvis Requested Procedure.

34.4.1.2.2 Extending the Scheduled Workflow Concepts to Include Post-Processing Tasks

The workflow concepts described above may be extended to include other Scheduled Procedure Steps, such as those used to describe post-processing tasks.

Some of the Scheduled Procedure Steps may be Image Post-Processing related. These Scheduled Procedure Steps would result in Post-Processing Performed Procedure Steps. This is illustrated by the following example of an MR Brain with a Functional Analysis Post-Processing.



In the above example, two different Scheduled Procedure Steps have been defined for the Requested Procedure. This reflects the fact that in this radiology department, the functional analysis post-processing is not performed by the MR Technologist, but by the Radiologist and therefore needs to be independently scheduled on an independent workstation. Another department may well choose to have the Technologist perform the post-processing immediately after the MR acquisition (either on the MR itself or on a co-located workstation). In that case the Requested Procedure would include a single Scheduled Procedure Step that includes both the acquisition and the post-processing task.

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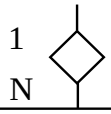
This Section does not provide an exhaustive description of all the workflow cases supported by the IHE Scheduled Workflow.b Profile, nor does it describe the Workflow enabled by other IHE Integration Profiles such as the Presentation of Grouped Procedures, Post-Processing Workflow and Reporting Workflow.

34.4.1.3 Scheduled Workflow Information Model

The Scheduled Workflow Model is represented in this section as an Entity Relationship (ER) diagram. The Scheduled Workflow Model is based on the DICOM and HL7 standards. The keys relating the entities and the unique keys of each entity are defined and the cardinality of the entities is indicated.

An example of the conventions used to specify an entity's relationships is presented in Figure 34.4.1.3-1



Entity Name
Foreign Key (FK) relating this entity to previous - The FK is shown to clarify the ER diagram and not intended to represent a relational model.
Unique Key (U) for this entity. There are cases where Unique keys that are identical within the scope of this document have different contextual meanings, as defined in this document. The "+" symbol indicates two attributes must be combined to guarantee uniqueness.

Figure 34.4.1.3-1: Example of the Entity Relationship Diagram

Figures 34.4.1.3-2 and 34.4.1.3-3 present the overview of the IHE Information Model. Mappings between specific HL7 Elements and DICOM Attributes are identified in RAD TF-2: Appendix B.

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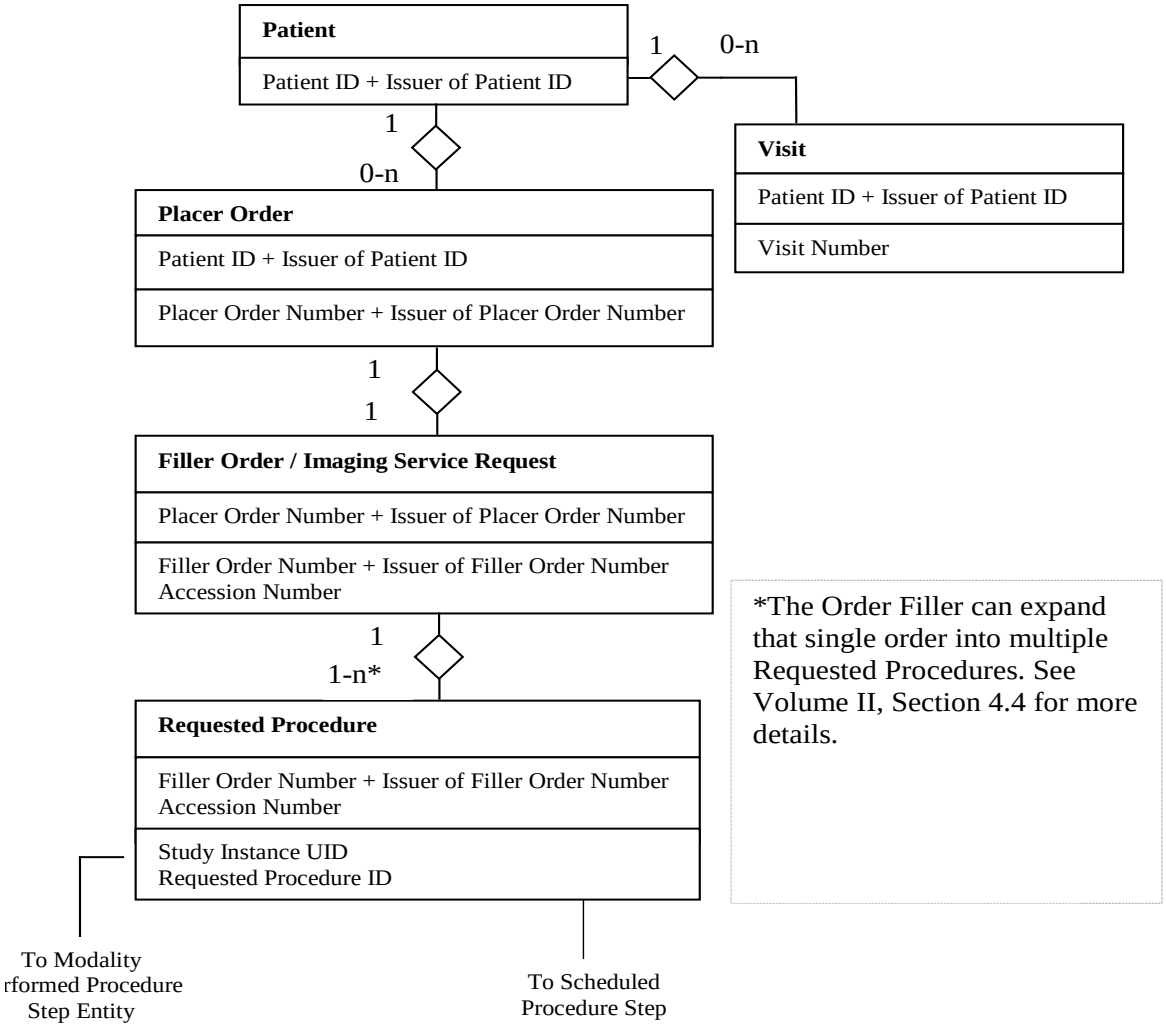

590 **Figure 34.4.1.3-2: Schedule Workflow Information Model**

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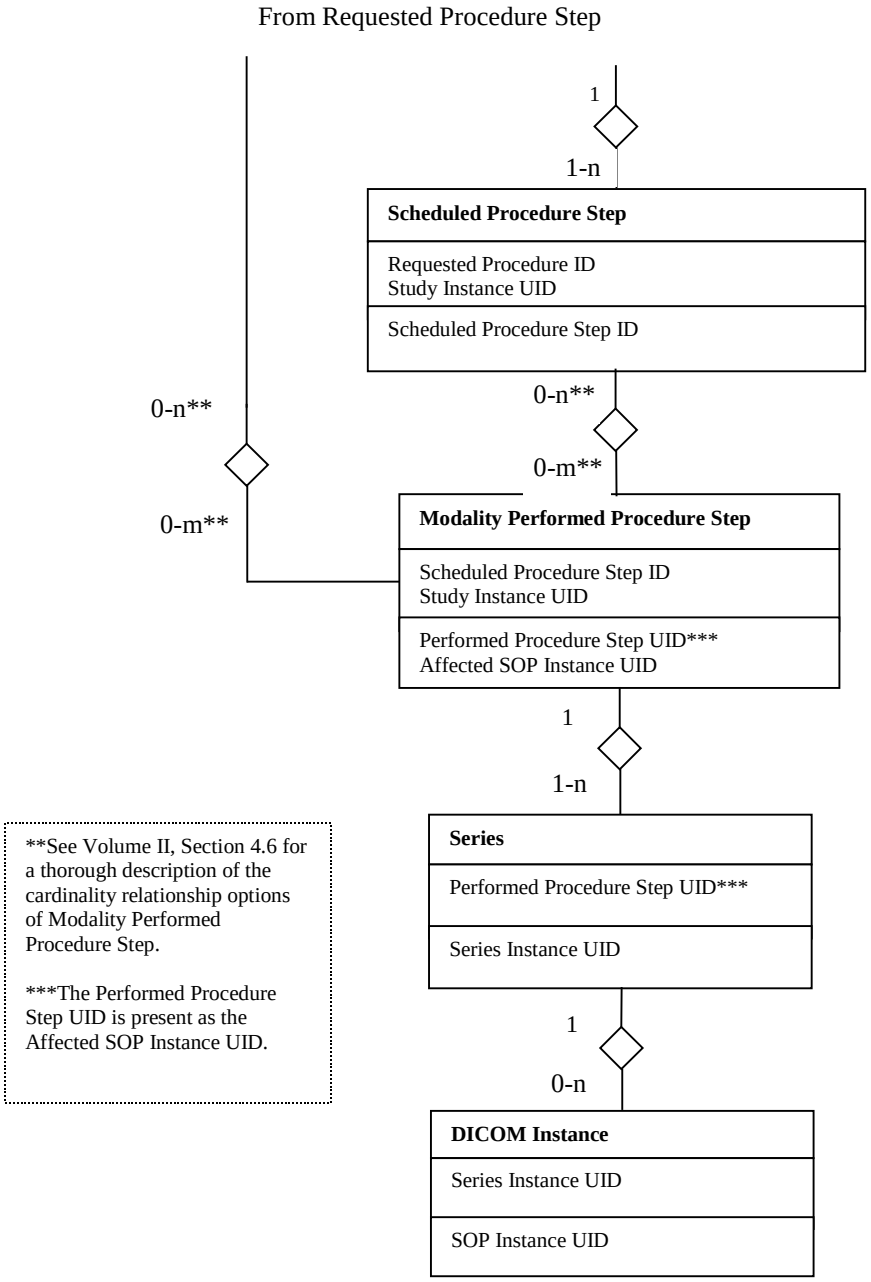

595 **Figure 34.4.1.3-3: Schedule Workflow Information Model, continued**

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34.4.2 Use Cases

This section first describes the process and information flow of patient care as it is defined in the IHE Technical Framework under "normal" circumstances, reflecting a typical patient encounter from registration/admission through the performance of an ordered procedure. Next a number of workflow variations (patient update, order change, exception management, implicit post-processing and departmental appointment notification) are described and finally, a variety of use cases related to handling unidentified patients.

The unidentified patient cases cover trauma cases or emergency room patients when a patient's condition requires that a procedure be conducted immediately. This may need to be done before steps like proper patient registration, ordering and/or scheduling of the procedure are performed (due to the lack of either information or time or other deviation from the normal process flow). In this case patient/study information must be later reconciled and properly updated at the ADT, Order Placer, Department System Scheduler/Order Filler, and Image Manager. There are several examples of information flow in this case shown in Uses Cases #7-13.

The ADT may utilize a Master Patient Index (MPI) to resolve the patient information to the correct Patient ID.

The IHE Technical Framework also supports cases when registration or temporary registration of a patient by ADT is not applicable or desired, for example:

- Emergency Department patient can be identified but, due to time or system availability constraints the procedure must be performed before proper order entry and scheduling may occur.
- Patient ID, though valid, has never been propagated to all actors due to communication failures, or the wrong patient record was used in ordering/scheduling.
- Patient ID, though valid, has been mistyped at the modality.
- Patient cannot be registered at the ADT by the time of the procedure. The patient presents to the Order Filler Actor (Imaging Department) and the order is placed and performed in the department.

Patient reconciliation may also be initiated on the department level. In the case of procedures performed on the unidentified patient in multiple departments (e.g., Radiology and Laboratory), this will require reconciliation of patient information in multiple locations.

See Appendix C for an overview of the information exchange between the Department System Scheduler/Order Filler and Image Manager.

To support the Scheduled Workflow.b Profile, an actor that claims support of other content profiles (Consistent Presentation of Images, Key Image Notes or Evidence Documents) is required to support the relevant storage, query and retrieve transactions and manage creation and reconciliation of those objects in the same way images are supported. The following diagrams will mostly show the management of images.

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In case of DICOM SR, the patient information might be included in the content sequence. The update of the patient information in the report header might result in inconsistent header information with the report content. The patient information update shall not create a new SR SOP instance, according to DICOM SR SOP Class behavior as described in DICOM PS 3.4, Annex O.

In the Unidentified Patient use cases, for the purpose of simplification, the following transactions were generally omitted from the corresponding diagrams:

- Modality Performed Procedure Step In Progress [RAD-6]
- Modality Images Stored [RAD-8]
- Modality Presentation State Stored [RAD-9]
- Storage Commitment [RAD-10]

These transactions may occur within the time frame of the diagram, but their content does not affect each of the use cases.

34.4.2.1 Use Case #1: Simple

34.4.2.1.1 Simple Use Case Description

The most typical (“normal”) case involves a radiology procedure being ordered, scheduled and performed for a registered patient.

The administrative steps involve a patient being registered, an order being placed for the registered patient, and the order being scheduled. The procedure is then performed, with imaging data being produced and status messages communicated to interested systems.

This case covers both inpatient and outpatient procedures. The patient may be new or known to the current healthcare facility.

34.4.2.1.2 Simple Process Flow

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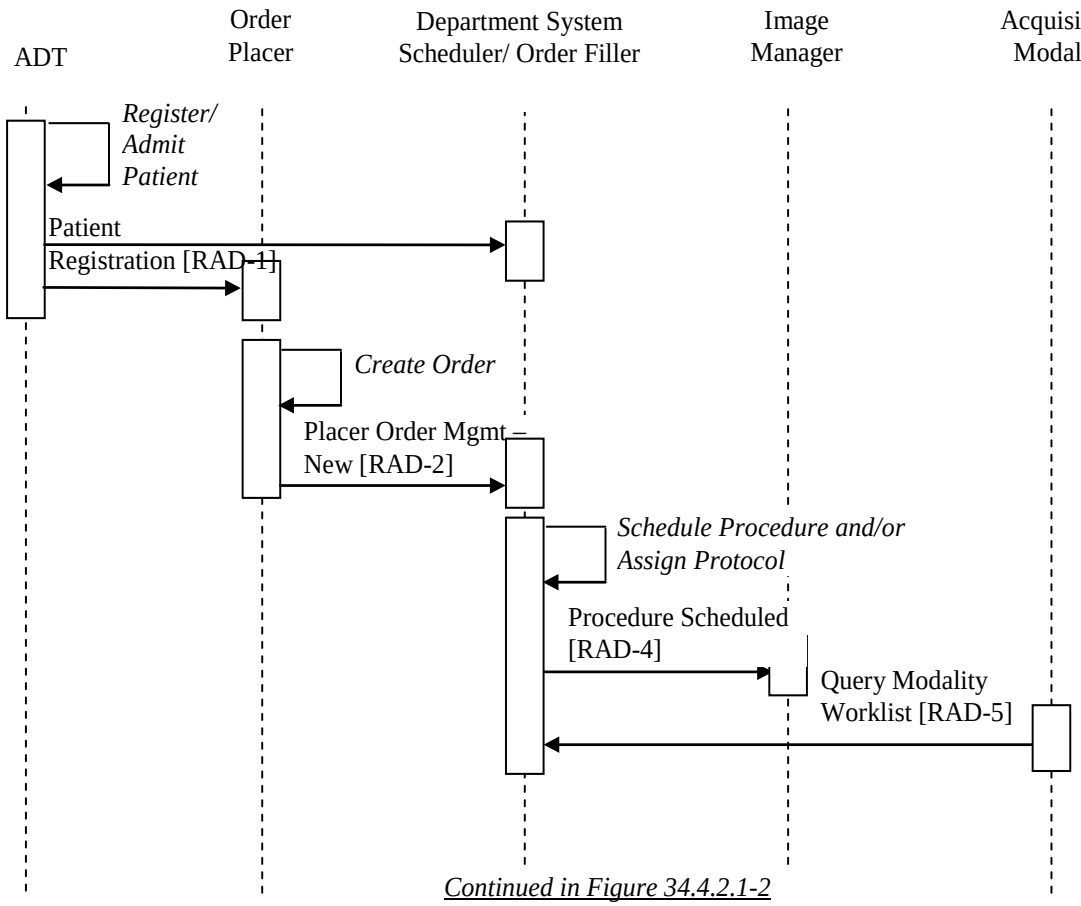

Figure 34.4.2.1.2-1: Administrative Process Flow in SWF.b

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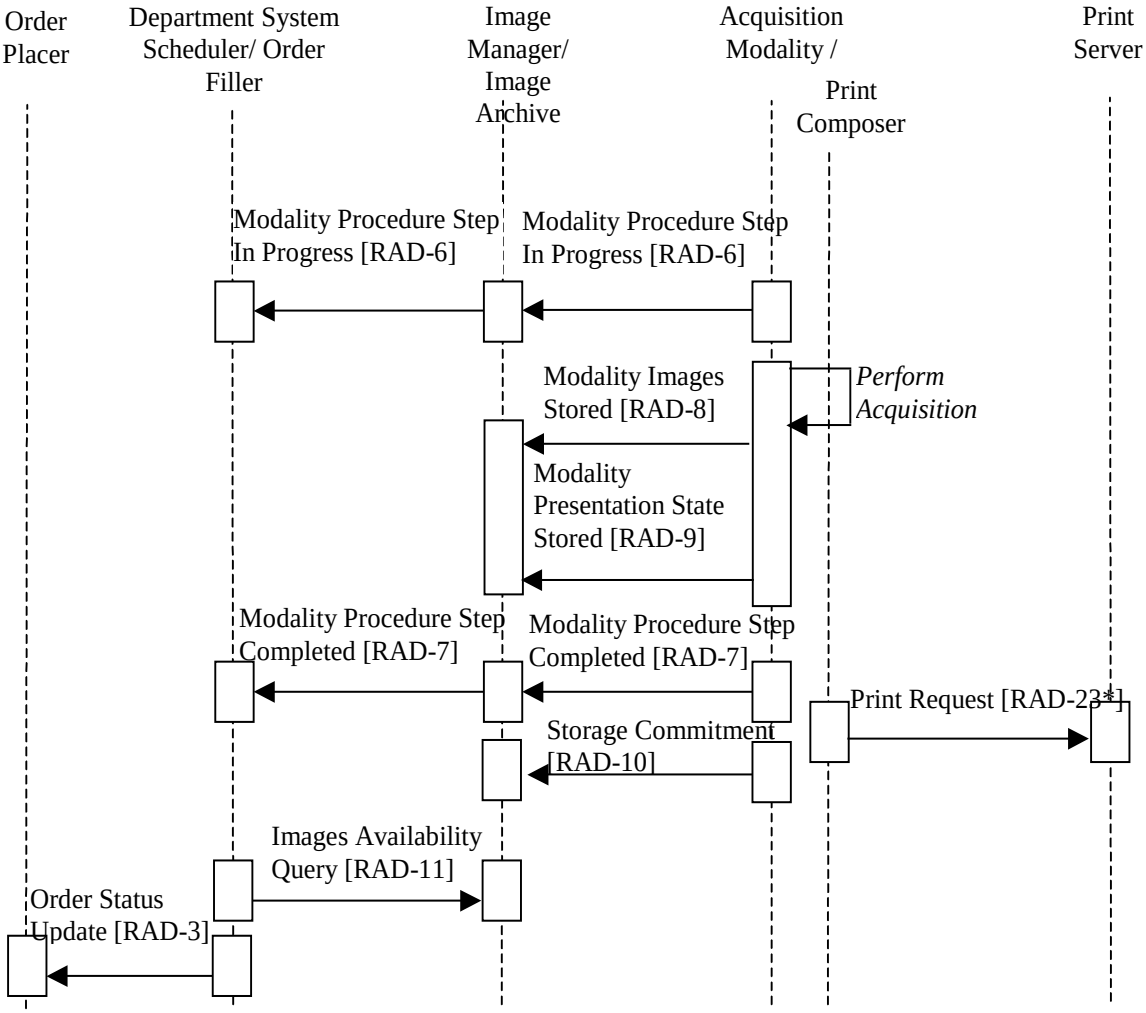

Figure 34.4.2.1.2-2: Procedure Performance Process Flow in SWF.b

Note: The Print Request [RAD-23] transaction is not a part of this profile; it is displayed for illustration purposes only.

The following should be noted in relation to the Administrative and Procedure Performance process flow:

The Print Composer is grouped with an Acquisition Modality but is shown separately in the diagram to distinguish the different transactions.

Schedule Procedure: The Department System associates the order with a number of Requested Procedures that have to be performed to satisfy the order. Each Requested Procedure prescribes a number of actions that have to be performed by Acquisition Modalities. Actions are grouped into Scheduled Procedure Steps based on the timing and ordering. Scheduled Procedure Steps are scheduled, i.e., assigned a time slot and performing resource (modality).

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Protocol Assigned: The radiologist determines the protocol (i.e., settings and conditions to be used in performing the Scheduled Procedure Steps); in particular, the ordered list of codes identifying the protocol for each of the steps. This may happen prior to, simultaneous with, or subsequent to the *Schedule Procedure* process step.

The diagram above shows one particular sequencing of the Modality Procedure Step Completed [RAD-7] transaction. This transaction may occur at any point following the creation of an image and/or Presentation State (GSPS) objects. This means it can occur before images and/or GSPS are stored, after storage, after printing (as in this example), or even after storage commitment. The IHE Technical Framework does not specify the timing of this transaction in relation to other transactions.

The diagram above shows the managed creation of images. The equivalent flow applies to other Evidence Documents that the actor supports.

34.4.2.2 Use Case #2: Patient Update

This case covers the situation where patient information updates are introduced into the system at various stages of the normal process flow.

34.4.2.2.1 Patient Update Use Case Description

Such updates will cause additional transactions to occur to assure synchronization of information between interested actors. Only the affected parts of the normal flow diagram are presented below. All subsequent process steps will progress according to the normal flow diagram.

Three subcases are shown based on when the patient update is initiated:

- After the patient is registered but before the order is entered
- After the order is entered but before the procedure is scheduled
- After the procedure is scheduled

The *Modify Patient* process includes changing inpatient demographics, merging two patient records and moving the information from one patient record to another.

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34.4.2.2.2 Patient Update Process Flow

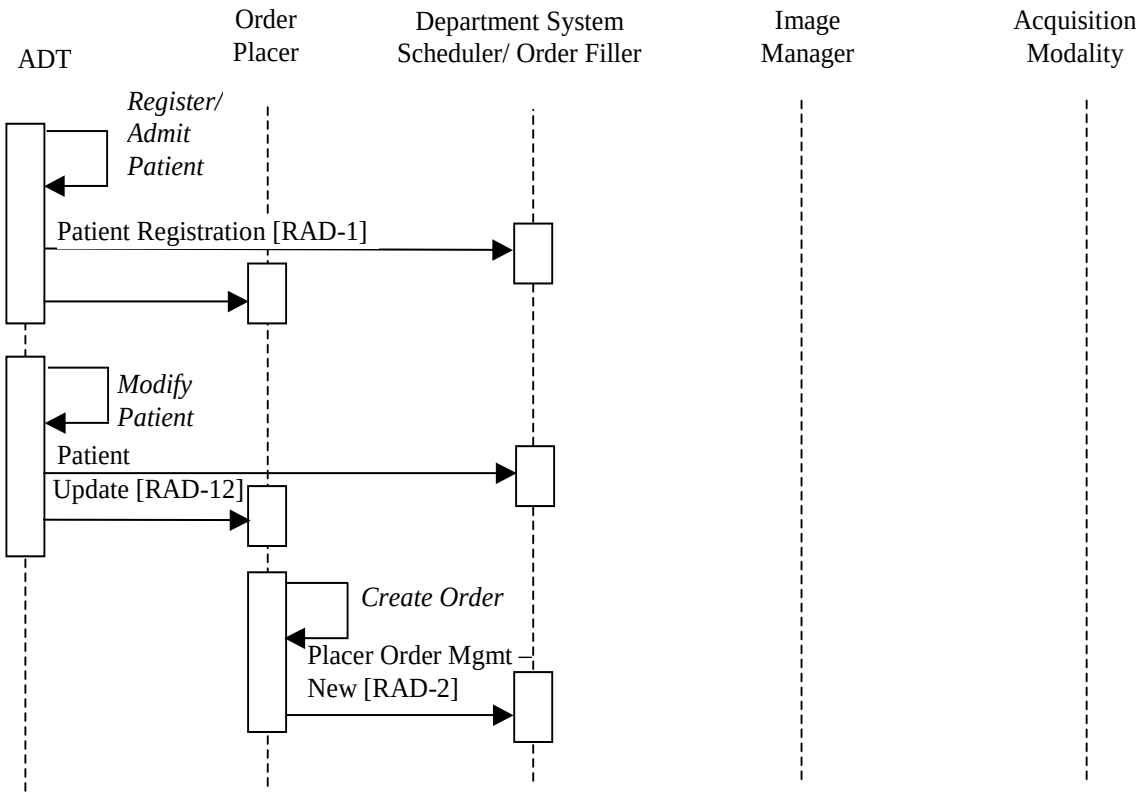

Figure 34.4.2.2.2-1: Patient Update Before Order Entry in SWF.b

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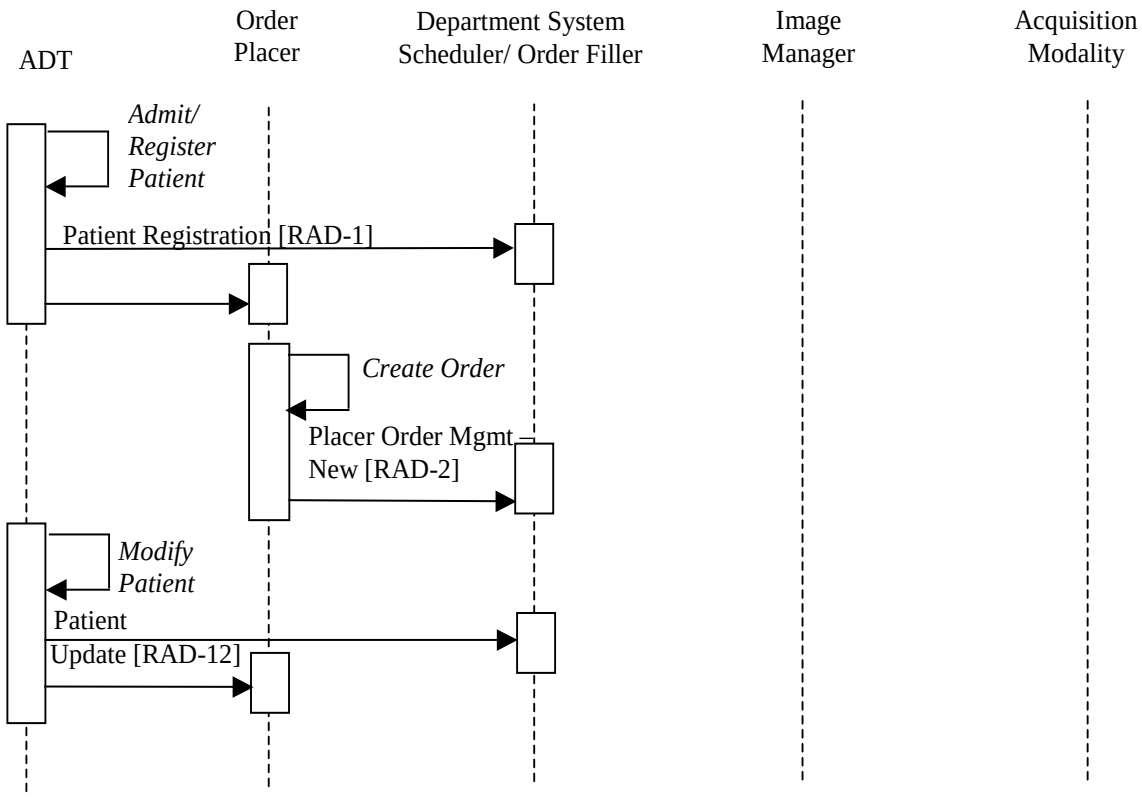

720 **Figure 34.4.2.2.2-2: Patient Update After Order Entry in SWF.b**

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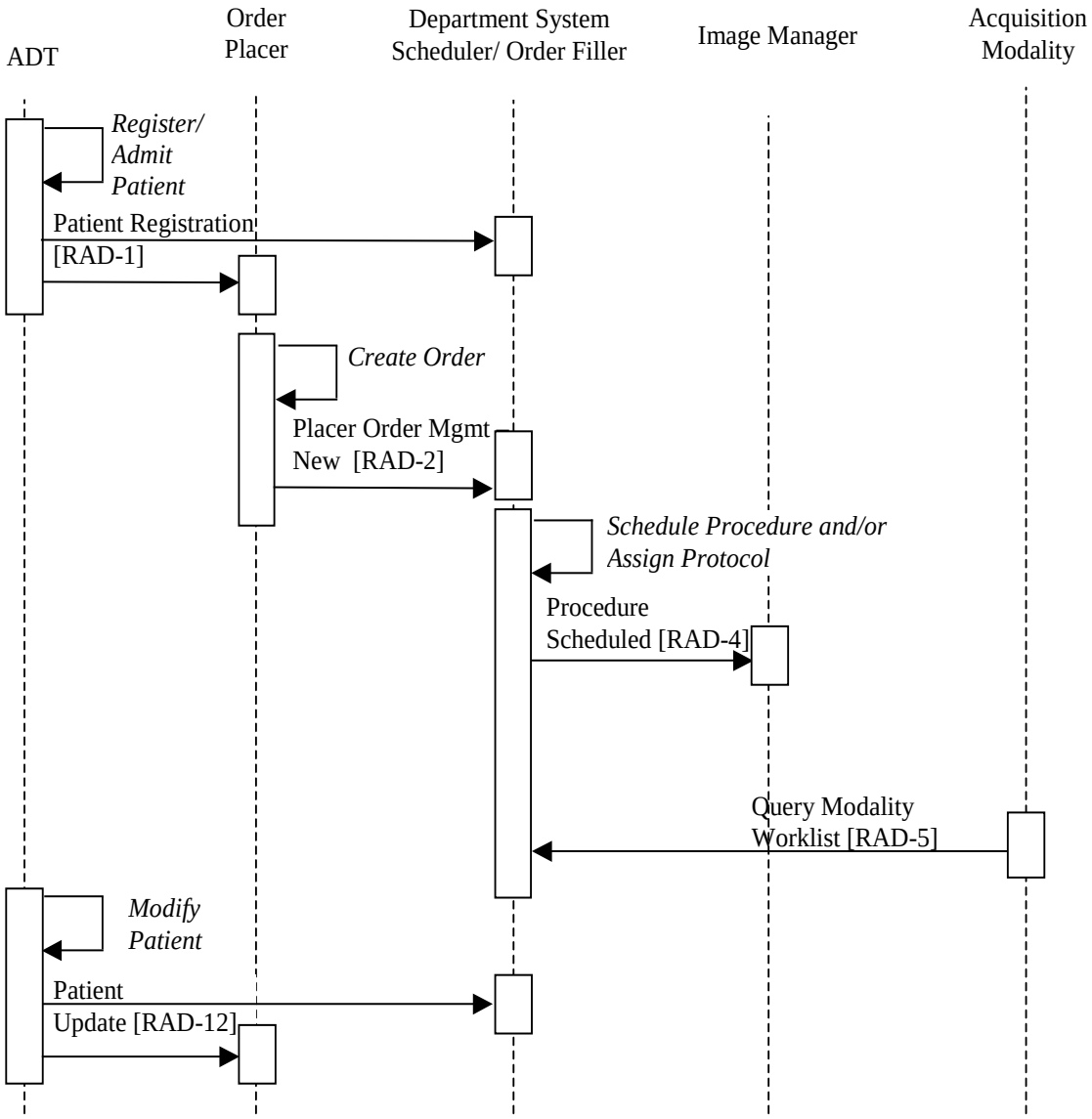

Figure 34.4.2.2.2-3: Patient Update After Procedure Scheduling in SWF.b

Note that in later use cases the Image Manager will also be notified and will have additional responsibility when Patient updates occur.

34.4.2.3 Use Case #3: Order Change

This case covers the situation when the Order Placer or the Department System Scheduler/Order Filler has to change order information or cancel/discontinue an order.

34.4.2.3.1 Order Change Use Case Description

When an order information change is necessary, the IHE Technical Framework allows for the initiating actor to change the order in a single message with the new information. Figures 34.4.2.3.2-1 and 34.4.2.3.2-2 depict examples of order change flow initiated by the Order Placer

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and the Department System Scheduler/Order Filler respectively. Note that one should consider these transactions as being performed between the process flow fragments depicted in the Figures 34.4.2.1-1 and 34.4.2.1-2 to ensure synchronization of information between interested actors.

Such updates will cause additional transactions to occur to assure synchronization of information between interested actors. Only the affected parts of the normal flow diagram are presented below. All subsequent process steps will progress according to the normal flow diagram.

Three subcases are shown based on when the patient update is initiated:

- After the patient is registered but before the order is entered
- After the order is entered but before the procedure is scheduled
- After the procedure is scheduled

The *Modify Patient* process includes changing inpatient demographics, merging two patient records and moving the information from one patient record to another.

34.4.2.3.2 Order Change Process Flow

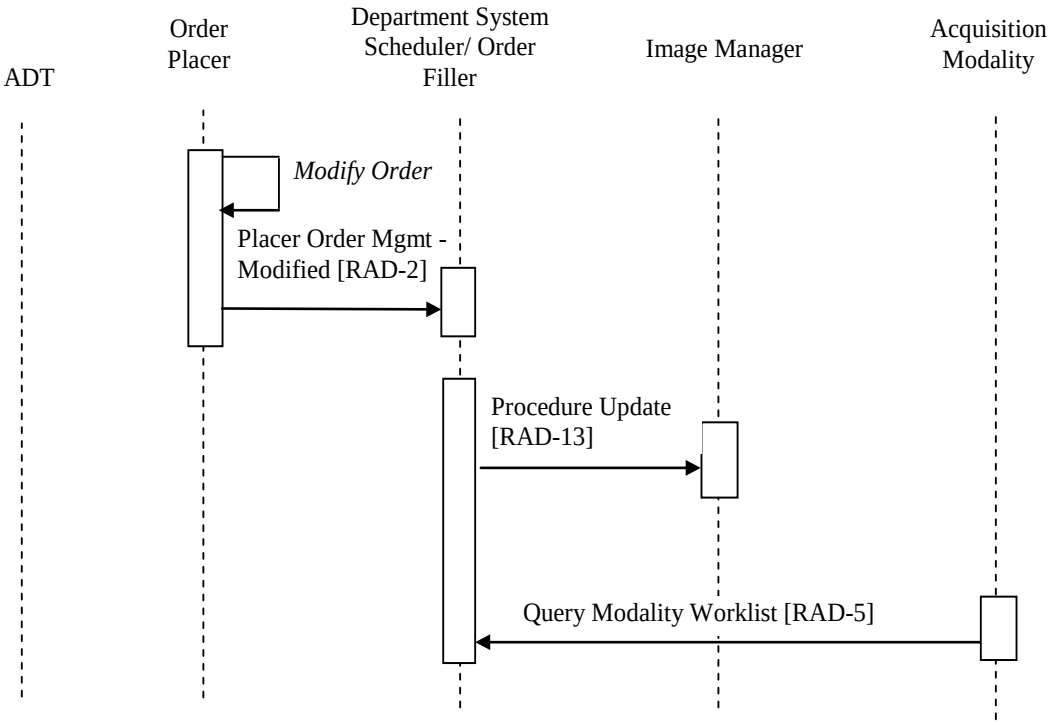

Figure 34.4.2.3.2-1: Order Modified by the Order Placer

Department System Scheduler/Order Filler may modify an order originally received from the Order Placer, as shown in Figure 34.4.2.3.2-2.

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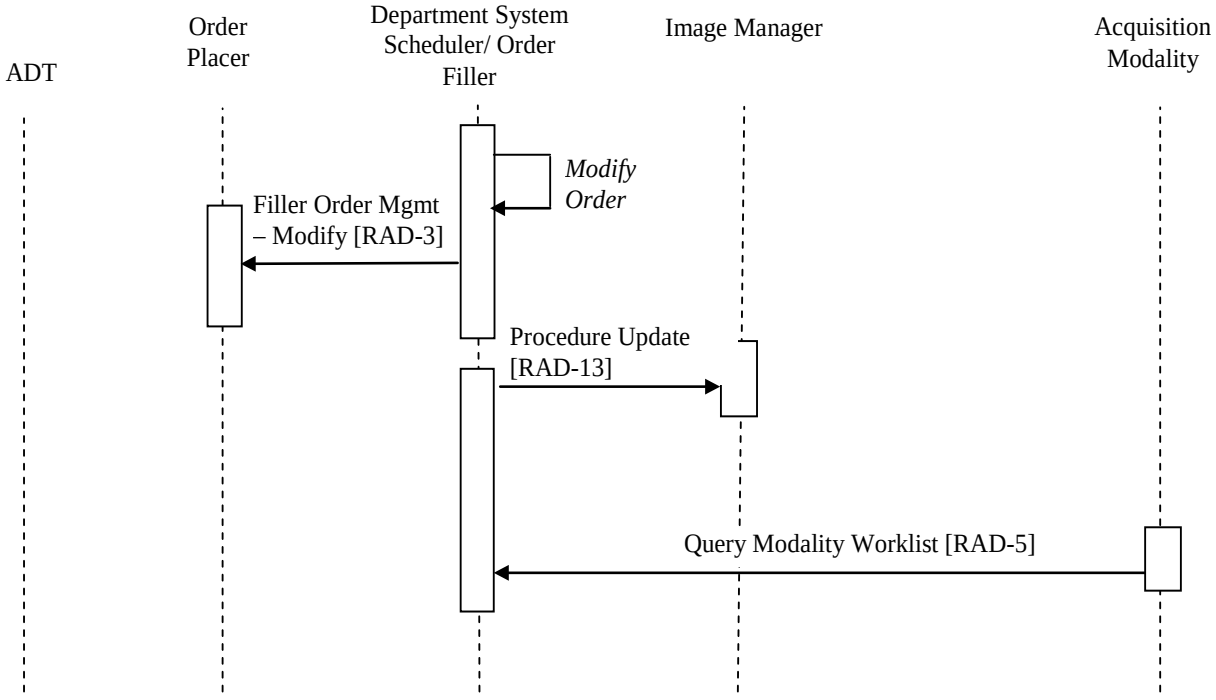

Figure 34.4.2.3.2-2: Order Modified by the Department System Scheduler/Order Filler

The Order Placer may not change an order that has already been started, i.e., one for which Order Filler has transmitted an "In-Progress" status. However, if the Order Filler receives the change order message after it has sent the Status Update message (for example, in a case of a race condition between two messages), Order Filler will accept the change order and perform Transaction RAD-13 Procedure Update to notify Image Manager.

The Order Filler may not change a scheduled procedure step that has already been started, i.e., one for which the Acquisition Modality has transmitted an "In-Progress" status. The IHE Technical Framework does not support notification to the modality of the Scheduled Procedure Step discontinuation or change after the Modality Procedure Step In Progress message has been generated by the Acquisition Modality, i.e., the current procedure step will be completed even though the order could be changed or discontinued.

34.4.2.4 Use Case #4: Exception Management Without Reason Codes

This case addresses the need to manage errors at the modality (but without providing coded reasons for the exception).

34.4.2.4.1 Exception Management Without Reason Codes Use Case Description

The types of exceptions covered by this case are as follows:

- Selection of the incorrect Scheduled Procedure Step from the Modality Worklist.

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- Handling the consequences of having performed a procedure step other than the scheduled one.

The following numbered items list exception cases that shall be supported by the actors listed in each item.

In the course of the scheduled workflow, such exceptions may occur at different times:

1. Before the Modality Procedure Step in Progress transaction is issued, the Operator/Radiologist changes the order on the Department System Scheduler which then provides the Modality Worklist as defined by the Scheduled Workflow.b Integration Profile (see the Order Change flow described in Section 34.4.2.3). This will ensure that the most recent Worklist Information is used by the Modality. The Acquisition Modality shall be able to process new worklist information that results from this order change; when or how the modality re-queries the Department System Scheduler is not specified by this framework.

2. After the Modality Procedure Step in Progress transaction has been issued, but before the Modality Procedure Step Completed transaction is issued, the Operator/Radiologist may discontinue the PPS. In this case any images that may have been acquired are part of the discontinued PPS and they shall be Storage Committed. This case is supported by Abandoned case (see RAD TF-2:4.6.4.1.2.3.5) of the Scheduled Workflow.b Integration Profile. (See also 34.4.2.5 for a description of Discontinuation with Reason).

3. After the Modality Procedure Step Completed transaction has been issued, the Operator/Radiologist may notice or become aware that an incorrect worklist entry selection was made. Whether this occurs before the Requested Procedure is read or afterwards, the modality is not responsible for performing the necessary corrections. Rather the Image Manager Actor and the Department System Scheduler/Order Filler Actor must make such corrections (See RAD TF-2:4.7.4.1.3.1). The Image Manager and the Order Filler may also offer a correction capability to recover the erroneous instances. IHE does not provide a mechanism to propagate automatically this correction between the Image Manager/Image Archive and the Department System Scheduler/Order Filler.

Acquisition Modalities are recommended, but not required, to support the following two cases to deal with using a different protocol at the modality as was scheduled by the Department System Scheduler/ Order Filler.

1. **After** the Modality Procedure Step in Progress transaction has been issued, but before the Modality Procedure Step Completed transaction is issued, the Operator/Radiologist may decide to modify the “in progress” Performed Procedure Step from what was intended by the Requested Procedure and Scheduled Procedure Step selected. In the Scheduled Workflow.b Integration Profile, the Acquisition Modality Actor notifies the PPS Manager (and in turn the Image Manager and the Department System Scheduler) by returning a Procedure Code Sequence of zero length. In addition, if the ASSISTED ACQUISITION PROTOCOL SETTING Option is supported by the Acquisition Modality, it can indicate this change by returning a Performed Protocol Code Sequence different from the Scheduled Protocol Code Sequence (see Figure 34.4.2.4.2-1below).

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2. **Before** the Modality Procedure Step in Progress transaction is issued, the Operator/Radiologist decides to proceed without changing the order on the Department System Scheduler/Order Filler by performing one or more Procedure Steps different than scheduled by the Modality Worklist entry as defined by the Scheduled Workflow.b Integration Profile. Its handling at the Acquisition Modality may be facilitated by the ASSISTED ACQUISITION PROTOCOL SETTING Option.

34.4.2.4.2 Basic Exception Management Process Flow

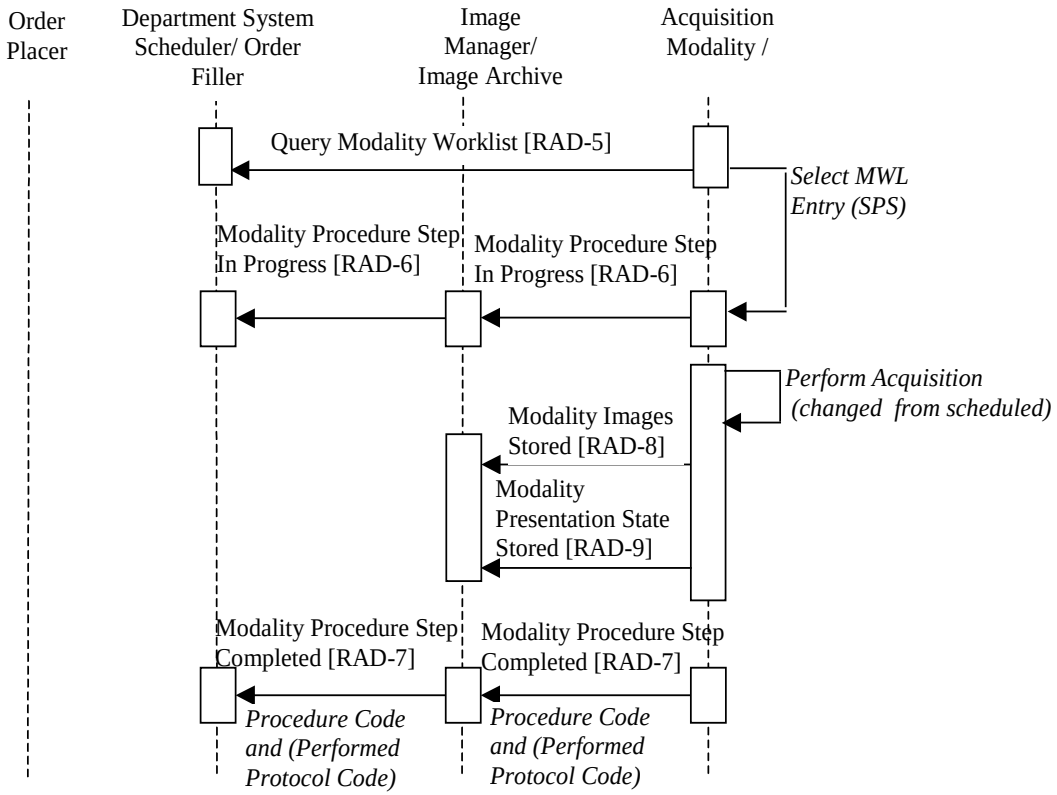

Figure 34.4.2.4.2-1: Exception Management Workflow (Changed from Scheduled on Modality)

34.4.2.5 Use Case #5: Exception Management With Reason Codes

34.4.2.5.1 Exception Management With Reason Codes Use Case Description

These additional use cases include providing coded reasons for the exception and are only required for systems claiming support of the PPS Exception Management Option (See 34.2.3).

1. After the Modality Procedure Step In Progress transaction has been issued, the Operator/Radiologist may realize that the wrong SPS has been selected (incorrect patient

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or incorrect Requested Procedure/Order for the same patient). In this case some of the acquired images or other evidence objects may already have been stored to the Image Manager/Image Archive (with or without storage commitment confirmed). The Acquisition Modality Actor notifies the PPS Manager (and in turn, the Image Manager and the Department System Scheduler/Order Filler) of the error using the Reason Codes as described in RAD TF-2:4.7.4.1.2.2 so that these systems take appropriate action as described in RAD TF-2:4.7.4.1.3.1 (see Figure 34.4.2.6.2-1 below).

IHE does not define how the modality may dispose of and/or correct the images or other evidence objects. Each implementation may decide if it is useful to support the storage of the corrected images or other evidence objects, when clinically meaningful. However if they do, new *Modality Procedure Step in Progress/Completed* and Storage Commitment transactions shall be used.

2. As in sub-case 2 of Exception Management Without Reason Codes, after the Modality Procedure Step in Progress transaction has been issued, but before the Modality Procedure Step Completed transaction is issued, the Operator/Radiologist may discontinue the PPS. In addition to the Exception Management Without Reason Codes behavior, the Modality Actor also notifies the PPS Manager (and in turn the Image Manager and the Department System Scheduler) of the reason for the discontinuation using the Reason Codes as described in RAD TF-2:4.7.4.1.2.2 so that these systems may take the appropriate actions (see Figure 34.4.2.6.2-2 below).

34.4.2.5.2 Exception Management With Reason Codes Process Flow

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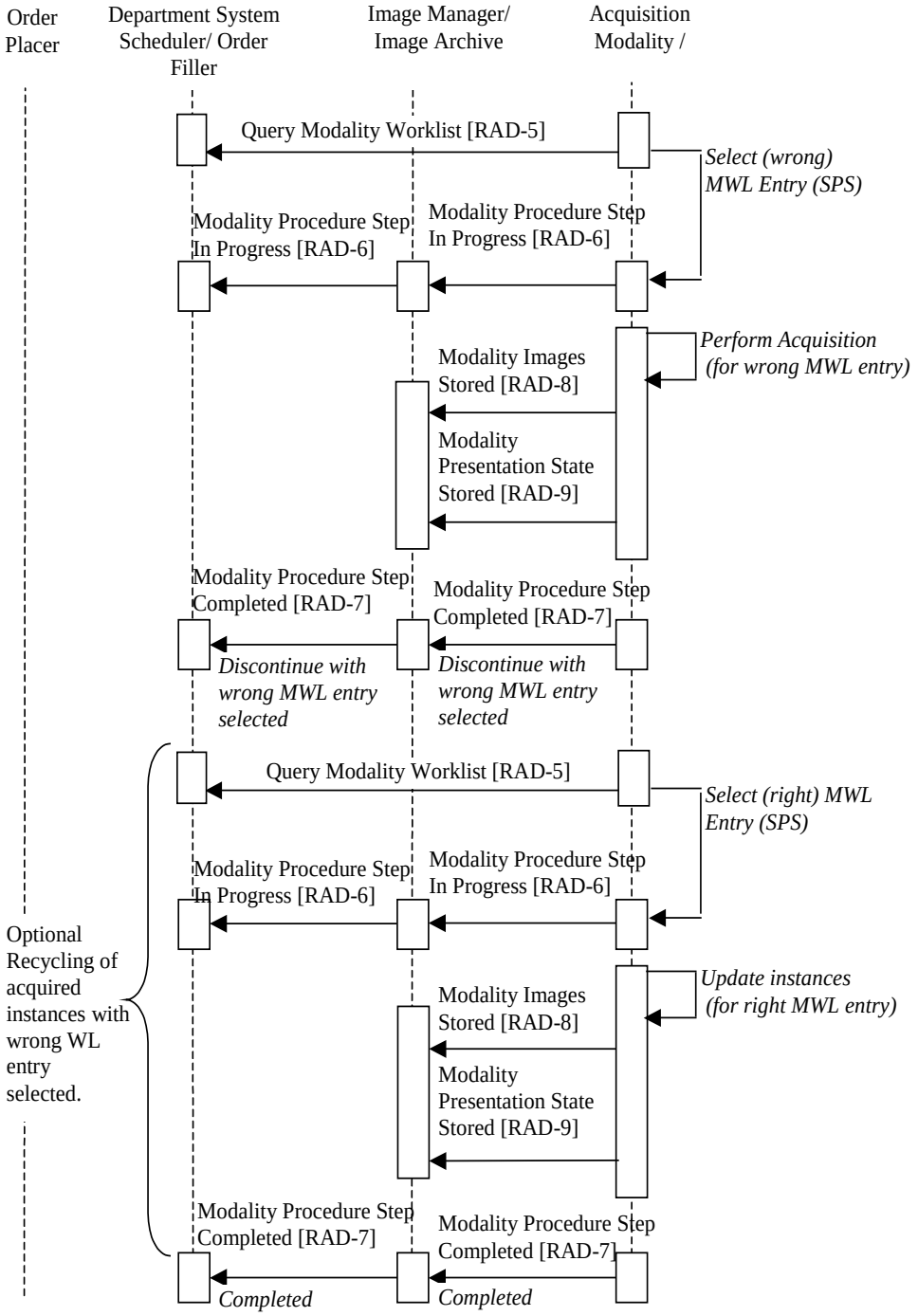

Figure 34.4.2.6.2-1: Exception Management Workflow (Wrong Worklist Entry Selected)

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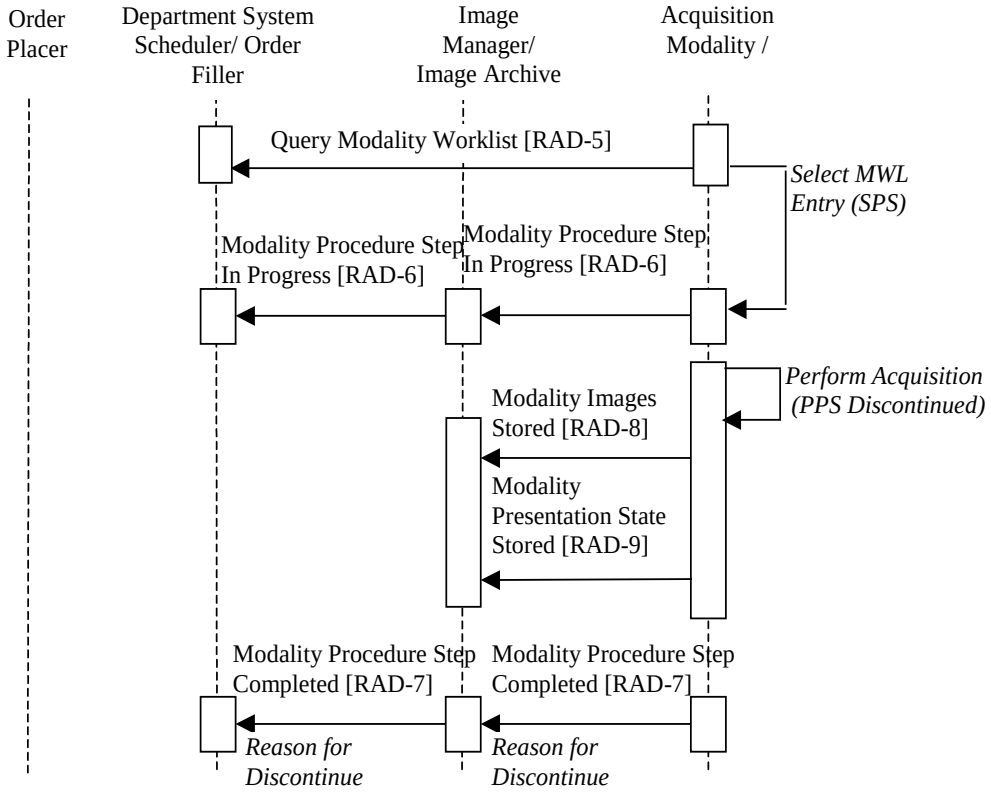

Figure 34.4.2.5.2-2: Exception Management Workflow (Discontinued with a Reason)

865

34.4.2.6 Use Case #6: Implicit Post-Processing

This case addresses image post-processing tasks performed as an implicit part of the scheduled workflow.

34.4.2.6.1 Implicit Post-Processing Use Case Description

870 In general, post-processing tasks scheduled and managed explicitly using post processing worklists are addressed by the Post-Processing Workflow Integration Profile (see Volume 1, Section 12 for further details on that profile). However, at some sites, post-processing tasks performed on the acquisition system or adjacent workstations are implied by the information in the acquisition worklist. In such cases, the post-processing is managed by the technician simply
875 carrying out the steps following acquisition.

Technicians may be instructed that certain post-processing should always be performed for certain acquisitions, or alternatively, different protocol codes may be provided in the acquisition worklist to indicate intended post-processing. In either case, no worklist is used on the post-processing Evidence Creator.

880 In the case of this “implicit post-processing workflow”, the Evidence Creator may obtain source images and other evidence objects necessary for post-processing by receiving them from the

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Acquisition Modality Actor (either pulled or pushed via some non-IHE defined mechanism) or by being grouped with an Image Display Actor (giving the system query/retrieve capabilities). Based on the information contained in the images, the Evidence Creator can send status messages and store its results according to the IHE transactions as shown in the following use cases.

34.4.2.6.2 Implicit Post-Processing Process Flow

The following sequence of steps describes the typical process flow when the Evidence Creator receives the images from an Acquisition Modality via some non-IHE means.

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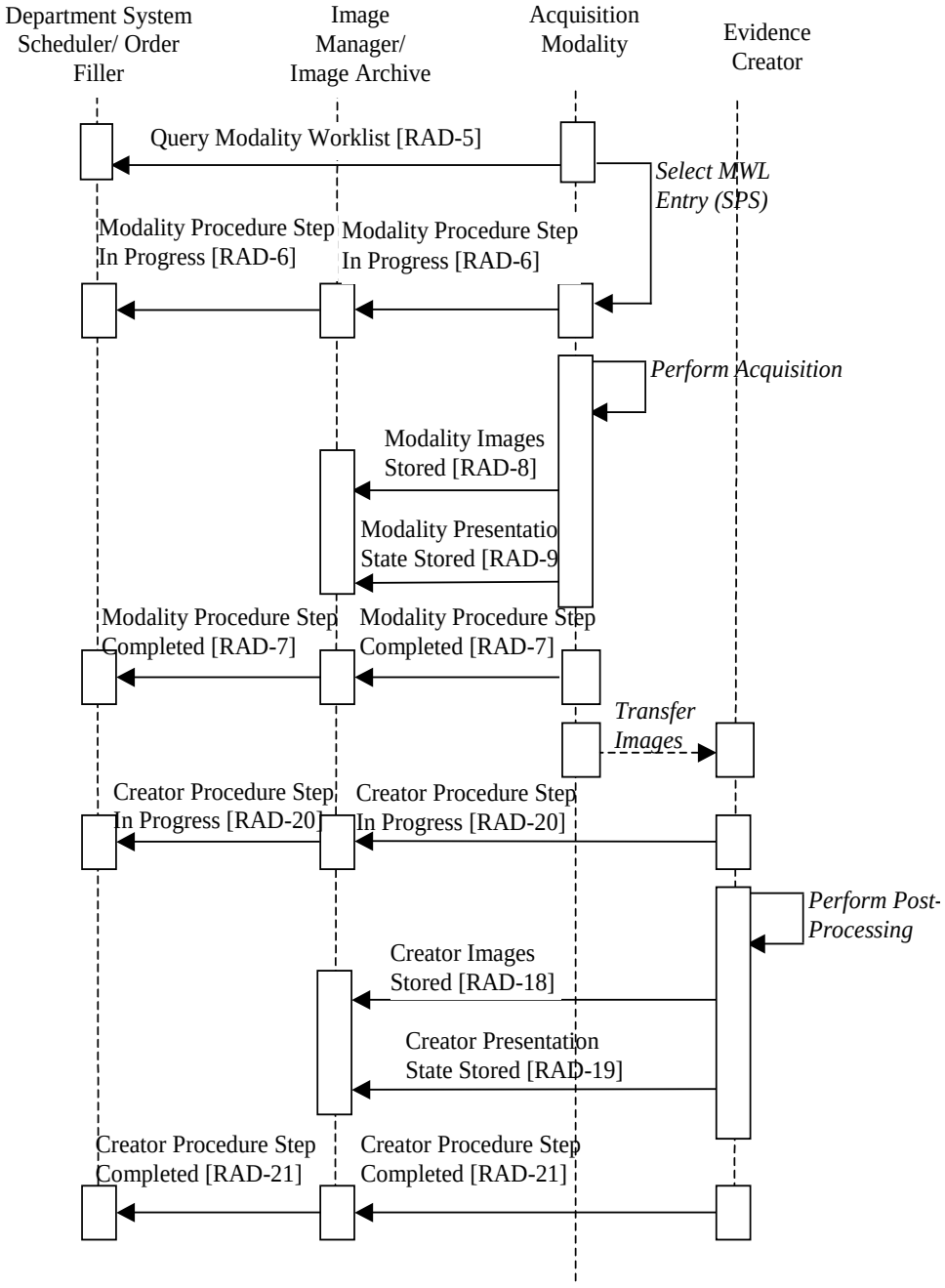

Figure 34.4.2.6.2-1: Post-processing in Scheduled Workflow.b

Note: the Modality Presentation State Stored [RAD-9] and Creator Presentation State Stored [RAD-19] transactions are not a part of this profile; they are displayed for illustration purposes only.

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The following should be noted in relation to the Post-Processing process flow in Scheduled Workflow.b as described above:

The images for post-processing are transferred from the Acquisition Modality to the Evidence Creator by means that are out of scope of the IHE Technical Framework.

Perform Post-Processing: The Evidence Creator uses the source images and/or other evidence objects it receives from the Acquisition Modality to perform post-processing tasks and generate new set(s) of images and/or other evidence documents. It uses information from the source images to populate the newly created objects and the Creator Performed Procedure Step Messages.

The following sequence of steps describes the typical process flow when Evidence Creator is grouped with Image Display.

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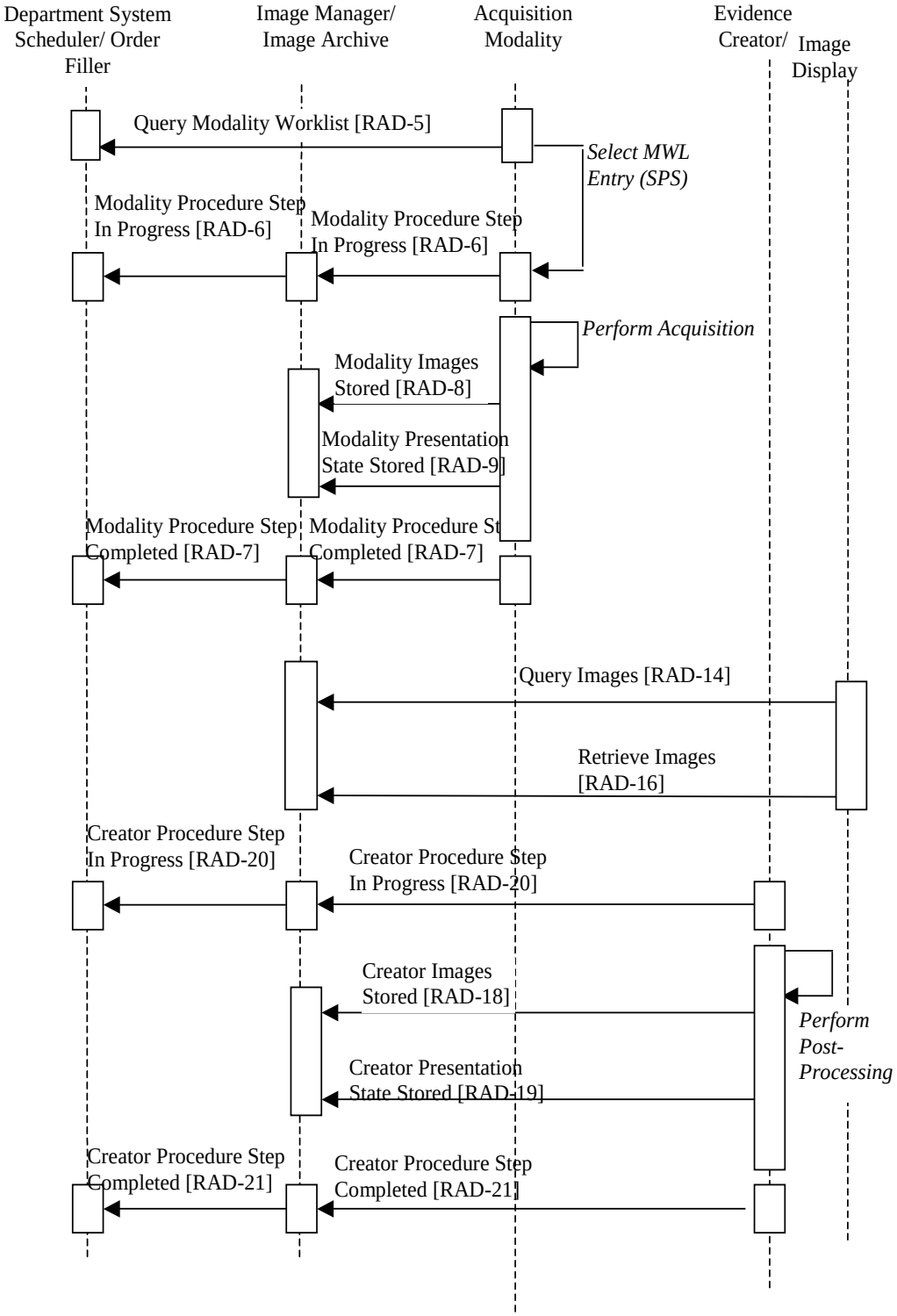

Figure 34.4.2.6.2-2: Post-processing in Scheduled Workflow.b (performed on Evidence Creator)

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Note: the Modality Presentation State Stored [RAD-9] and Creator Presentation State Stored [RAD-19] transactions are not a part of this profile; they are displayed for illustration purposes only.

The following should be noted in relation to the Post-Processing process flow on the independent workstation:

The Evidence Creator is grouped with the Image Display and the images for post-processing are retrieved from the Image Archive where the Acquisition Modality has transferred them.

Perform Post-Processing: The Evidence Creator uses the source images and/or other evidence objects it receives from the Image Archive to perform post-processing tasks and generate new set(s) of images and/or other evidence documents. It uses information from the source images to populate the newly created objects and the Creator Performed Procedure Step Messages.

34.4.2.7 Use Case #7: Departmental Appointment Booking

This case addresses the use of the Departmental Appointment Notification Option by the Order Placer and Order Filler Actors.

34.4.2.7.1 Departmental Appointment Booking Use Case Description

In the IHE Scheduled Workflow.b Integration Profile, the scheduling needed to perform an Order is managed by the Departmental System Scheduler/Order Filler. The Order Placer may request along with an Order a preferred date and time for this Order, but it is the Order Filler that sets, updates and possibly cancels the appointment(s) for examinations. When a new Order is placed by the Order Placer or the Order Filler, an Appointment Notification (New Bookings) is sent to the Order Placer. This Appointment Notification (New Bookings) may include several appointments bookings in case some of the Scheduled Procedure Steps require separate appointments. Equally, one or more Scheduled Procedure Steps may be scheduled during the same appointment booking.

If any changes to some of these appointments are made by the Order Filler, it issues an Appointment Notification (Reschedule Bookings) to inform the Order Placer of the change. If that appointment is cancelled by the Order Filler, it issues an Appointment Notification (Cancel Bookings) to the Order Placer.

Although the Order Placer is kept aware of any scheduling changes that may be made by the Order Filler, no mechanism is defined in this Integration Profile to request an appointment change. For such a change, a phone call to the person entering orders on the Order Filler could be used.

34.4.2.7.2 Departmental Appointment Booking Process Flow

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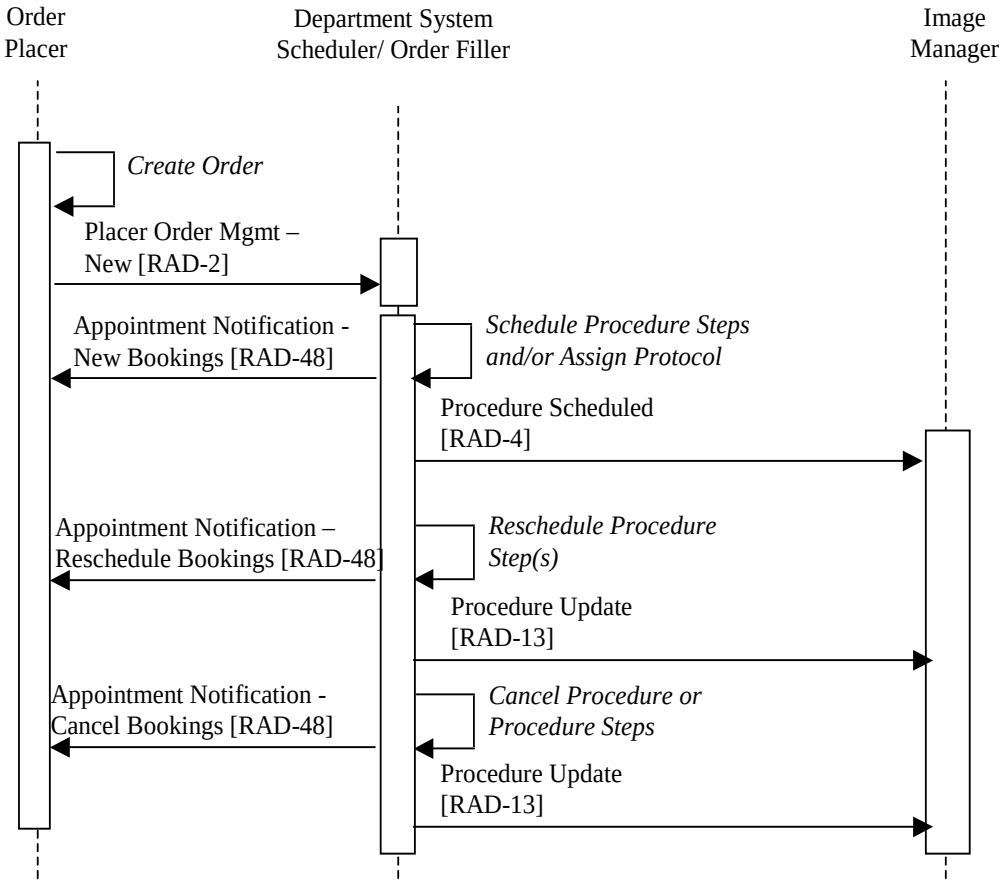

Figure 34.4.2.7.2-1: Departmental Appointment Booking Process Flow

34.4.2.8 Use Case #8: Unidentified Patient Registered at ADT and Ordered at the Order Placer

34.4.2.8.1 Unidentified Patient Registered at ADT and Ordered at the Order Placer Use Case Description

In this case, the Unidentified Patient has been registered at the ADT and the procedure Ordered at the Order Placer.

The ADT is a single point of patient reconciliation in the enterprise. Process flow requires that any unidentified patient be assigned a permanent Patient ID and a temporary name (e.g., “John Doe”). All subsequent transactions follow the normal flow (see Section 34.4.2.1) including order entry and procedure scheduling. When the real patient identity is known, the ADT is responsible for reconciliation of its own records as well as informing the Order Placer and Department System Scheduler/Order Filler about corresponding changes. The ADT sends a Patient Update message to both the Order Placer and Department System Scheduler/Order Filler. The Department System Scheduler/Order Filler sends the Patient Update message to the Image Manager and the Report Manager.

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Significant Transactions:

To reconcile the patient information, the ADT may register a new patient and merge the temporary patient with the correct patient and send both Patient Registration [RAD-1] and Patient Update [RAD-12] (Merge) transactions.

If a permanent Patient ID was assigned, then the ADT may only send a Patient Update [RAD-12] transaction with proper information.

Note that the Performed Procedure Step Manager is not shown on the Process Flow diagrams and is presumed to be grouped with the Image Manager. It may be grouped with the Department System Scheduler/Order Filler with corresponding changes in the flow of PPS related transactions between the Image Manager and Department System Scheduler/Order Filler.

34.4.2.8.2 Unidentified Patient Registered at ADT and Ordered at the Order Placer Process Flow

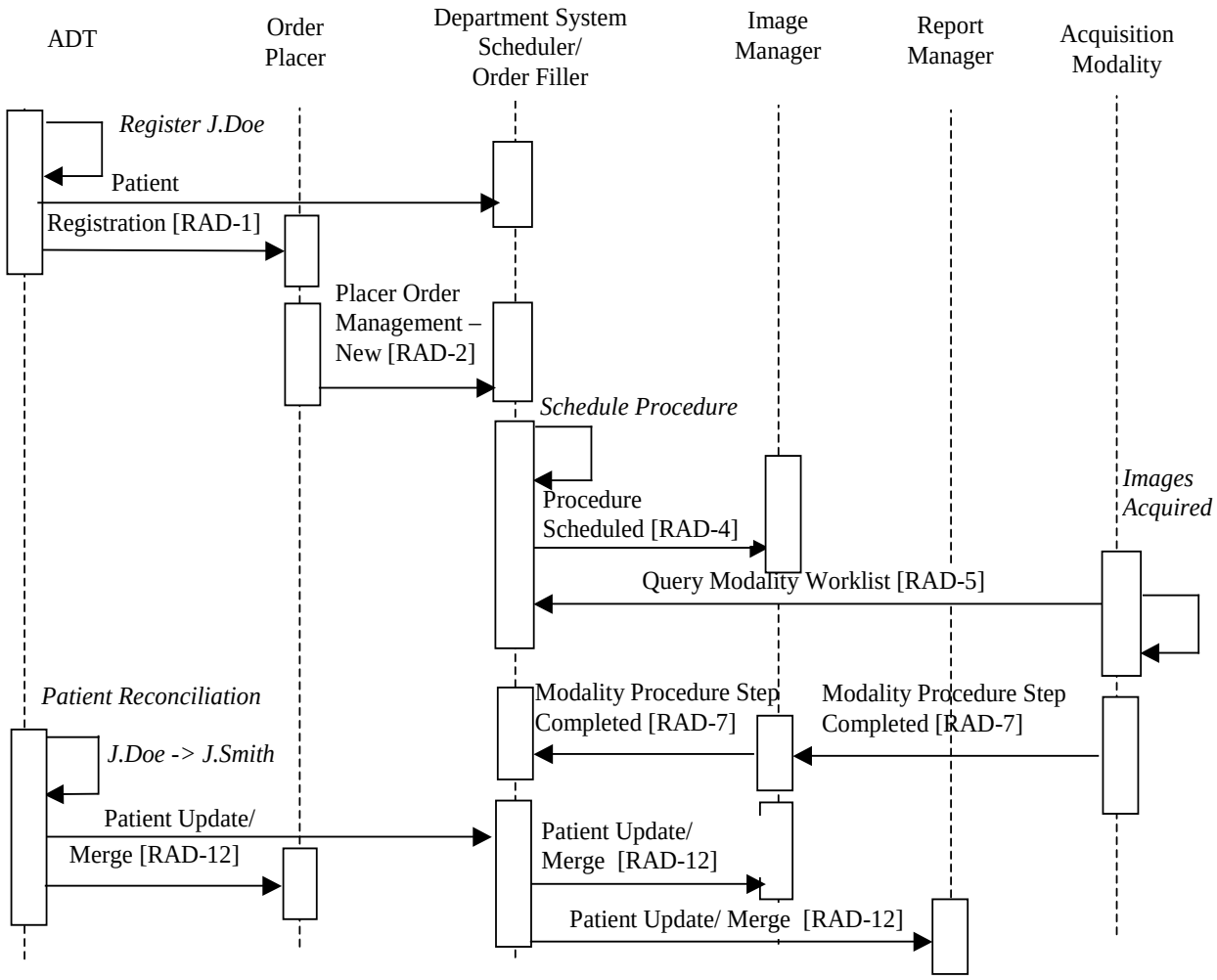

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Figure 34.4.2.8.2-1: Unidentified Patient – Placer Order

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34.4.2.9 Use Case #9: Unidentified Patient Registered at ADT and Ordered at Department System Scheduler/Order Filler

34.4.2.9.1 Unidentified Patient Registered at ADT and Ordered at Department System Scheduler/Order Filler Use Case Description

This case is based on case 7. However, in this situation the order for a procedure is generated by the Department System Scheduler/Order Filler and submitted to the Order Placer. Procedures are scheduled normally and image acquisition uses modality worklist. When the patient information is reconciled, the ADT sends the Patient Update messages to both the Order Placer and Department System Scheduler/Order Filler. The Department System Scheduler/Order Filler sends the Patient Update message to the Image Manager and the Report Manager.

Significant Transactions:

To reconcile the patient information, the ADT may register a new patient and merge the temporary patient with the correct patient and send both registration and merge transactions.

If a permanent Patient ID was assigned, then the ADT may only send a Patient Update transaction with proper information.

A Filler Order Management (New Order) transaction [RAD-3] is sent from Department System Scheduler/Order Filler to the Order Placer.

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34.4.2.9.2 Unidentified Patient Registered at ADT and Ordered at Department System Scheduler/Order Filler Process Flow

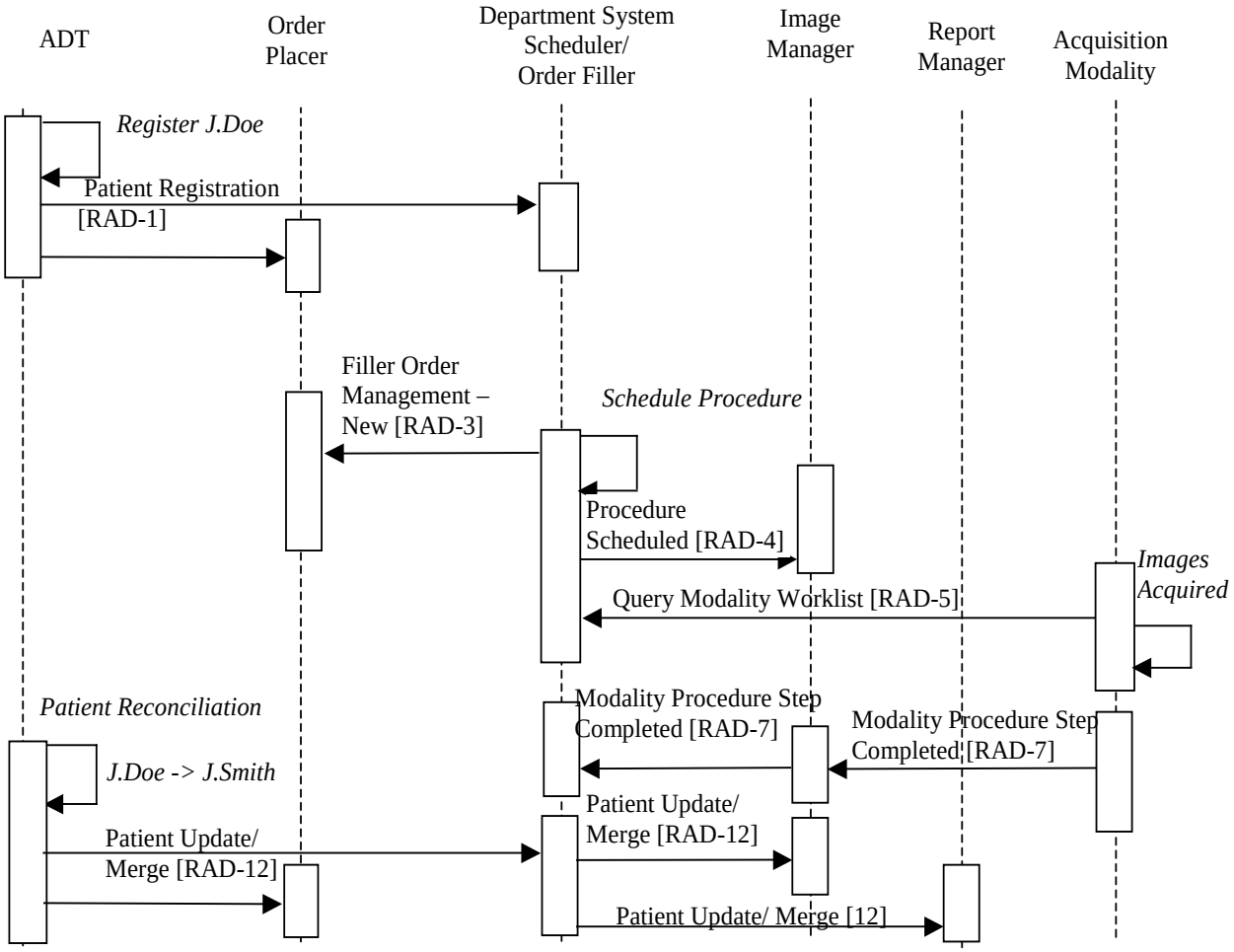

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Figure 34.4.2.9.2-1: Unidentified Patient – Filler Order

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34.4.2.10 Use Case #10: Unidentified Patient Registered at ADT but Completed at Modality Prior to Order

34.4.2.10.1 Unidentified Patient Registered at ADT but Completed at Modality Prior to Order Use Case Description

As in cases 8 and 9, this uses a permanent Patient ID generated by the ADT. However, no order entry or scheduling takes place before the Acquisition Modality performs the procedure. A permanent Patient ID and a temporary name are manually entered at the Acquisition Modality (typically, from a card) and conveyed to the Department System Scheduler/Order Filler and the Image Manager by the Acquisition Modality. Subsequently, the Department System Scheduler/Order Filler generates and submits an order to the Order Placer. When the patient information is reconciled, the ADT sends the Patient Update messages to both the Order Placer and the Department System Scheduler/Order Filler. The Department System Scheduler/Order Filler sends a Patient Update message to the Image Manager and the Report Manager.

Significant Transactions:

On receiving a Modality Procedure Step Completed [RAD-7], the Department System Scheduler/Order Filler recognizes it as an unscheduled case.

The Department System Scheduler/Order Filler sends a Filler Order Management (New Order) transaction [RAD-3] to the Order Placer.

Using the information from the Procedure Step Completed transaction and the placed order, the DSS/Order Filler creates a new Requested Procedure record and sends a Procedure Scheduled transaction to the Image Manager.

To reconcile the patient information, the ADT may register a new patient and merge the temporary patient with the correct patient and send both registration and merge transactions.

If a permanent Patient ID was assigned, then the ADT may only send a Patient Update transaction with proper information.

The DSS/Order Filler sends a Patient Update transaction to the Image Manager.

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34.4.2.10.2 Unidentified Patient Registered at ADT but Completed at Modality Prior to Order Process Flow

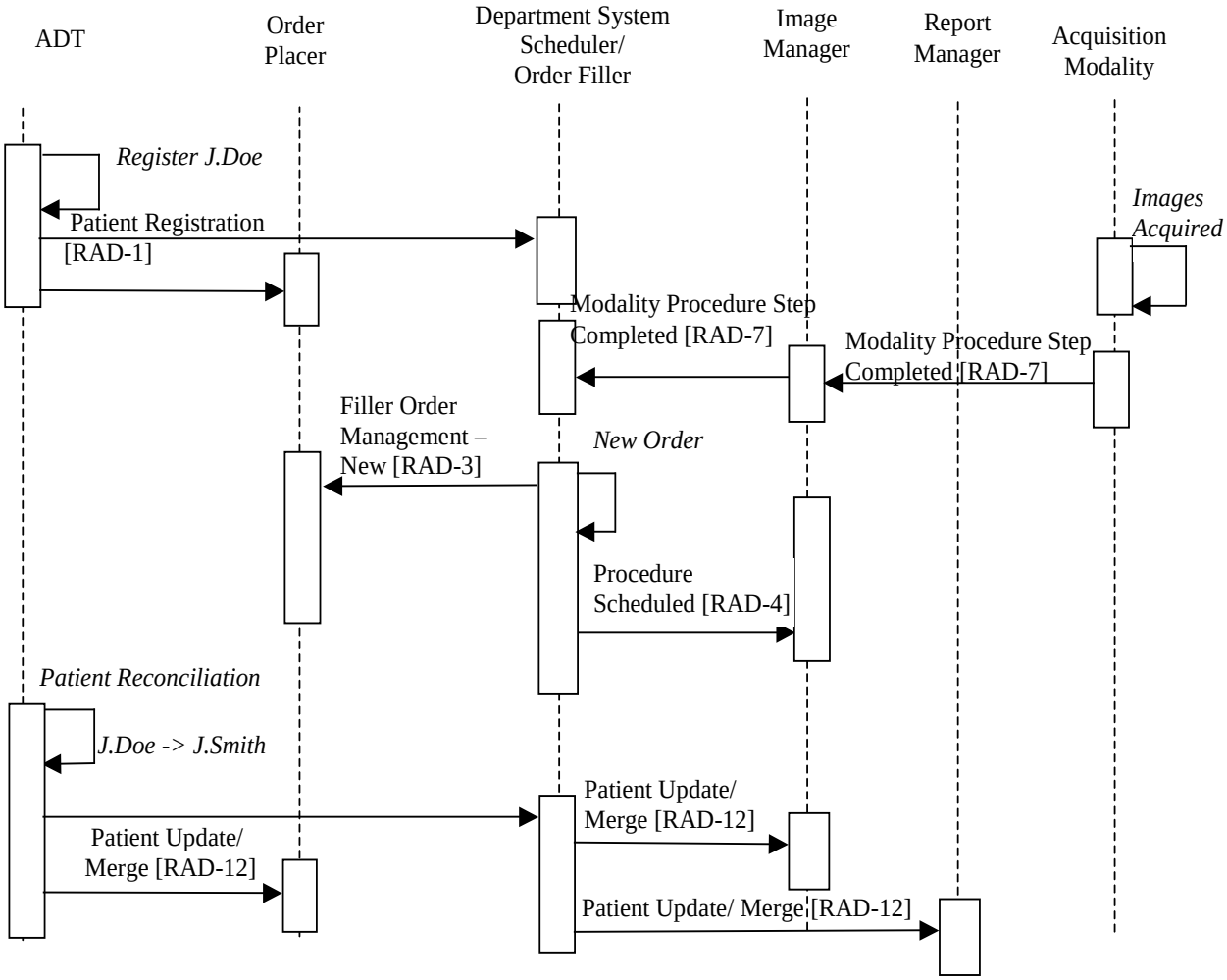

Figure 34.4.2.10.2-1: Unidentified Patient– Unscheduled

34.4.2.11 Use Case #11: Unidentified Patient Assigned Temporary Departmental ID and Scheduled at DSS/Order Filler

34.4.2.11.1 Unidentified Patient Assigned Temporary Departmental ID and Scheduled at DSS/Order Filler Use Case Description

In this case, no valid Patient ID is available to the Department System Scheduler/Order Filler. It assigns a temporary Patient ID and a temporary name and schedules the required procedure.

Note: The Department System Scheduler/Order Filler must ensure that the assigned temporary Patient ID is unique within its scope.

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The temporary Patient ID is conveyed to the Image Manager. When patient information becomes known, the ADT sends new patient information to both the Order Placer and the Department System Scheduler/Order Filler. The Department System Scheduler/Order Filler reconciles received patient information with that associated with the temporary Patient ID and merges the permanent patient record with its own temporary one and sends a Patient Update transaction to the Image Manager and the Report Manager. At the same time, the Department System Scheduler/Order Filler generates and submits an order to the Order Placer using a permanent Patient ID.

Significant Transactions:

Patient information is reconciled internally by the Department System Scheduler/Order Filler using the Patient Registration from ADT.

The Department System Scheduler/Order Filler sends the Patient Update [RAD-12] transaction to the Image Manager.

The Department System Scheduler/Order Filler sends the Filler Order Management (New Order) transaction [RAD-3] to the Order Placer.

The IHE Technical Framework also recognizes that the following 4-step case of handling unidentified patients may be utilized in certain installations:

1. The patient is delivered to the department, where a temporary departmental Patient ID and/or name are assigned.
2. The order is then entered by the Department System Scheduler/Order Filler and with this Patient ID and/or name, and the procedure is performed on the Acquisition Modality.
3. The Department System Scheduler/Order Filler sends a new order transaction to the Order Placer. This departmental Patient ID is shared by the Image Manager, Department System Scheduler/Order Filler and Order Placer. However, this departmental Patient ID is not known to the ADT.
4. After resolution of the patient identity, the ADT registers/admits the patient with the correct Patient ID and sends a message to the Order Placer and Department System Scheduler/Order Filler. Each system locally merges the new record with the existing one identified by the departmental Patient ID.

Because this case requires reconciliation at multiple points throughout the enterprise, IHE does not recommend this workflow.

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34.4.2.11.2 Unidentified Patient Assigned Temporary Departmental ID and Scheduled at DSS/Order Filler Process Flow

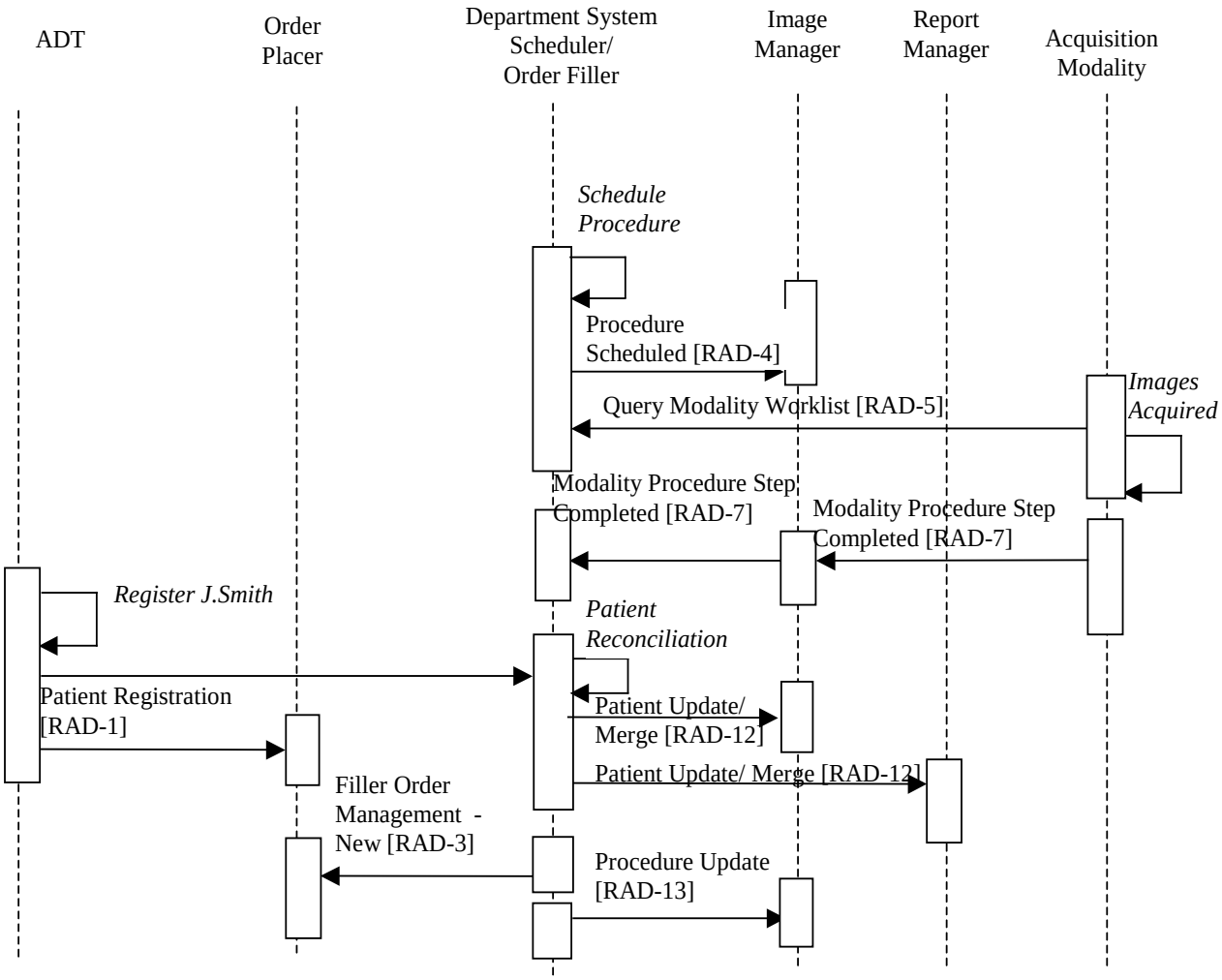

Figure 34.4.2.11.2-1: Unidentified Patient– Scheduled Temp ID

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34.4.2.12 Use Case #12: Image Acquisition Completed Without Scheduling at Department System Scheduler/Order Filler

34.4.2.12.1 Image Acquisition Completed Without Scheduling at Department System Scheduler/Order Filler Use Case Description

In this case, no valid Patient ID is available to the Department System Scheduler/Order Filler and no scheduling is done before the procedure is performed. A temporary ID and name are entered by the technologist at the Modality and conveyed to the Department System Scheduler/Order Filler and to the Image Manager. The Patient ID and name are selected by the technologist according to the locally defined rules; for example, selected from the predefined pool of "Patient ID–patient name" pairs. The rules for selecting temporary Patient ID shall guarantee its uniqueness within the scope of Department System Scheduler/Order Filler.

Upon receiving the Modality Procedure Step Completed message, the DSS/Order Filler and Image Manager recognize an unscheduled case based on the content of the message (absent or empty Referenced Study Sequence, see RAD TF-2, Appendix A). When patient information becomes known, the ADT sends the new patient information to both the Order Placer and Department System Scheduler/Order Filler. The Department System Scheduler/Order Filler performs a merge of the permanent patient record with the temporary one and sends a Patient Update to the Image Manager and the Report Manager. At the same time, Department System Scheduler/Order Filler generates and submits an order to the Order Placer using a valid Patient ID.

Significant Transactions:

On receiving a Procedure Step Completed transaction, the Department System Scheduler/Order Filler recognizes it as an unscheduled case.

Patient information is reconciled internally by the Department System Scheduler/Order Filler using the Patient Registration from the ADT.

The Department System Scheduler/Order Filler sends a Patient Update (Merge) transaction to the Image Manager and to the Report Manager.

The Department System Scheduler/Order Filler sends a Filler Order Management (New Order) transaction [RAD-3] to the Order Placer.

Using the information from the Procedure Step Completed transaction and placed order, the Department System Scheduler/Order Filler creates a new Requested Procedure record and sends a Procedure Scheduled [RAD-4] transaction to the Image Manager and Report Manager.

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34.4.2.12.1 Image Acquisition Completed Without Scheduling at Department System Scheduler/Order Filler Process Flow

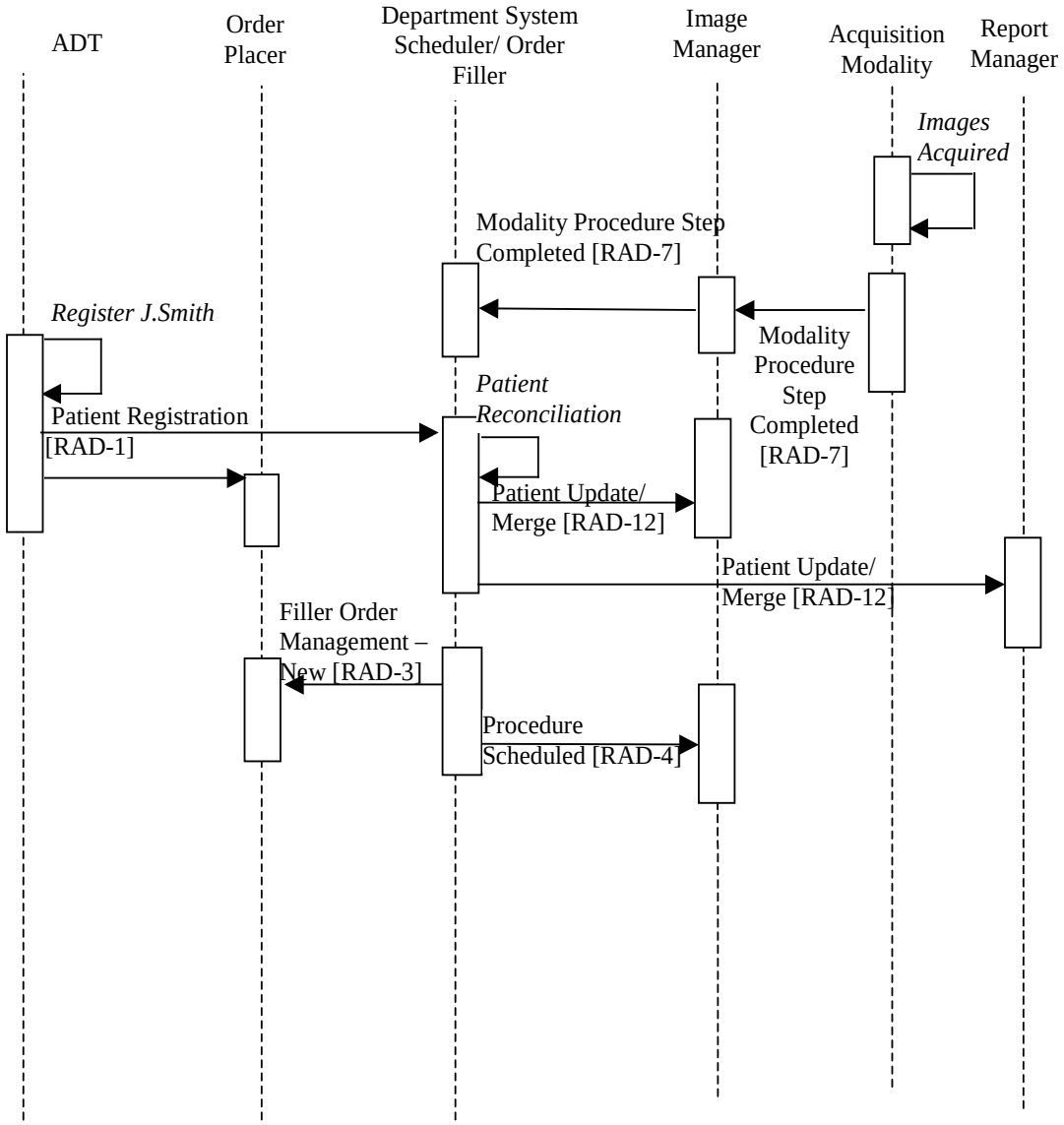

Figure 34.4.2.12.1-1: Unidentified Patient – Unscheduled Temp ID

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34.4.2.13 Use Case #13: Patient Information Reconciliation During Image Acquisition

34.4.2.13.1 Patient Information Reconciliation During Image Acquisition Use Case Description

This section describes the process flow related to the handling of image acquisition ongoing during patient reconciliation.

When a Patient Update occurs, in addition to the information exchange between the ADT, Order Placer and Department System Scheduler/Order Filler, Patient Update information is also sent to the Image Manager. Even after a Patient Update has occurred images coming from the Modality may continue to use the original Patient Information, so on-going Patient update with incoming images from the modality may be necessary. It is the responsibility of the Image Manager to ensure that the patient information is updated in the images, Grayscale Softcopy Presentation States and other Evidence Objects when they are retrieved from the Image Archive.

Updates may need to occur after the initial Patient Registration and Order Placement has occurred. The Modality may have requested information from the Department System Scheduler before the update has occurred and continue to send the images with the original Patient Registration and Order information. The Image Manager will need to continue updating the patient information from items retrieved from the Image Archive.

Significant Transactions:

The Modality may continue to send information using the original patient information even after the patient update has occurred.

The Image Manager must continue reconciling Patient Information even after the Patient Update transaction has been completed.

Only partial transactions are shown. Other transactions are performed according to the profile requirements.

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34.4.2.13.2 Patient Information Reconciliation During Image Acquisition Process Flow

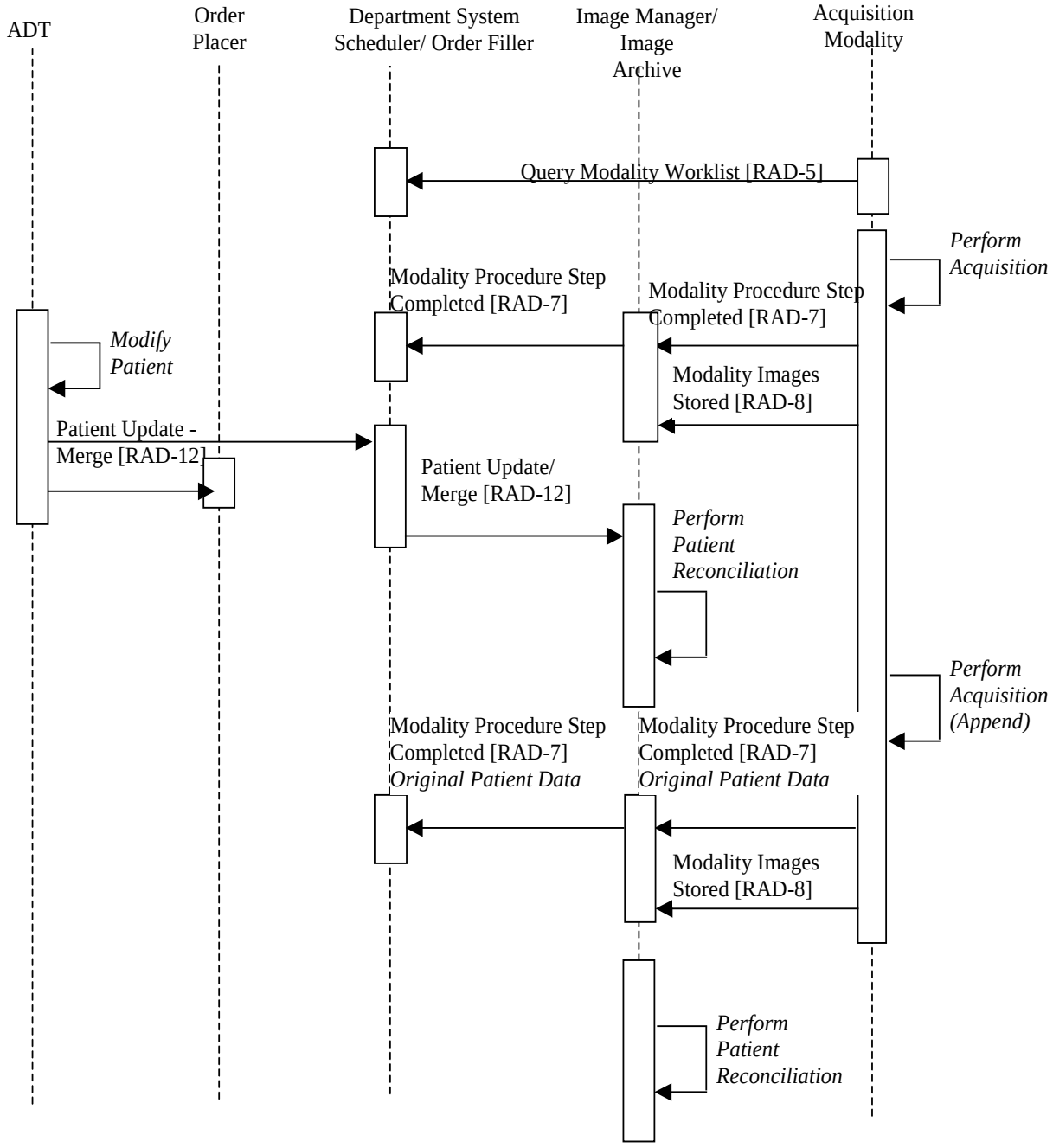

Figure 34.4.2.13.2-1: Reconciliation During Acquisition

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34.5 SWF.b Security Considerations

Refer to RAD TF-1:Appendix F Security Environment Considerations.

34.6 SWF.b Cross Profile Considerations

SWF – Scheduled Workflow

Systems which may be deployed in environments transitioning from HL7 v2.3.1 to HL7 v2.5.1 may find it useful to support both the new SWF.b Profile and the original Scheduled Workflow Profile (RAD TF-1: 3). Specifically, it would be useful to be able to configure for each system it communicates with using the referenced transactions whether HL7 v2.3.1 or HL7 v2.5.1 is used. In such a scenario, the actor might need to be able to receive HL7 v2.3.1 messages and send HL7 v2.5.1 messages or vice versa.

Modify Appendix B as shown below:

Appendix B – Topics for Standards Corrections or Supplements

B.1 HL7 Topics

B.1.1 Version 2.5.1

The IHE Radiology Technical Framework ~~**is primarily based on the**~~ **profiles several** version**s** ~~**2.3.1**~~ of the HL7 standard (See RAD TF-2: 2.4~~**.4**~~ for discussion of HL7 Versioning). The **Profile or Option that invokes a transaction** ~~**provided in the Technical Framework**~~ will specify the base version of HL7 used **if necessary**.

Details needed by IHE Radiology are not always available in all versions of HL7. For example, the Appointment Notification~~,~~ Transaction RAD-48 uses the SIU^S12 message first defined in HL7 Version 2.4 in order to take advantage of the additional scheduling information not available in previous versions.

Likewise, IHE has had to provide temporary solutions in custom segments where definitions have not existed. An example is the **HL7 v2.3.1 message semantics** ~~**definition**~~ of Transactions RAD-4 and RAD-13 which include a ZDS Segment as a temporary solution for handling Study Instance UID. A definition for the Study Instance UID did not exist until HL7 version 2.5 when definitions were added to the OMI (Imaging Order) message.

Modify Appendix G as shown below:

Appendix G – Patient Information Reconciliation for XDS-I.b (INFORMATIVE)

Patient Information Reconciliation (PIR) workflow within a local domain is well understood and addressed within the IHE PIR Integration Profile **and the IHE Scheduled Workflow.b**

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Integration Profile. However, within an XDS affinity domain, there is the added complexity of managing patient information within the XDS Registry and synchronizing data between the document sources, repository and registry.

The X**A**D**-PID Change Management** Profile **(XPID) ~~does not~~** address**es** **~~the~~ patient ID** challenges **in the context of an XDS environment. It allows a PIX Manager to notify an XDS Document Registry of external changes to XDS Affinity Domain Patient IDs (referred to as XAD-PIDs) so that it can affect these changes, as appropriate, in its database. ~~of PIR. The reason for this is scope management (at the time of writing the initial XDS Profile) as well as a lack of content profiles to stress the PIR issue. It is the intent of the ITI Technical Committee to address the issue of PIR within XDS in due course.~~**

Modify Appendix G.2 as shown below:

G.2 Patient Information Reconciliation (PIR) in an Affinity Domain

PIR workflow within a local domain is well understood and addressed within the IHE PIR Integration Profile **and the IHE Scheduled Workflow.b Integration Profile**. However, within an XDS affinity domain, there is the added complexity of managing patient information within the XDS Registry and synchronizing data between the document sources, repository and registry.

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Volume 2 – Transactions

Add the following paragraph to the beginning of each of the following Message Semantics Sections: 4.1.4.1.2, 4.1.4.2.2, 4.2.4.1.2, 4.2.4.2.2, 4.3.4.1.2, 4.3.4.2.2, 4.3.4.3.2, 4.4.4.1.2, 4.12.4.1.2, 4.12.4.2.2, 4.12.4.3.2, 4.12.4.4.2, 4.12.4.5.2, 4.13.4.2:

4.1.4.1.2 Message Semantics

Message semantics are defined for both HL7 v2.3.1 and HL7 v2.5.1. The Profile and/or Options being claimed that incorporate this transaction will specify whether actors are required to support one, the other, or both sets of semantics.

4.1.4.1.2.1 Message Semantics (HL7 v2.3.1)

Delete the word "Option" in the header for each section and subsection in 4.1.4.1.2.2, 4.1.4.2.2.2, 4.2.4.1.2.2, 4.2.4.2.2.2, 4.3.4.1.2.2, 4.3.4.2.2.2, 4.3.4.3.2.2, 4.4.4.1.2.2, 4.12.4.1.2.2, 4.12.4.2.2.2, 4.12.4.3.2.2, 4.12.4.4.2.2, 4.12.4.5.2.2 and in the table titles for Table 4.4-15, for example:

4.1.4.1.2.2 Message Semantics (HL7 v2.5.1 ~~Option~~)

Modify Section 4.1.4.1.2.2 as shown below:

~~**Actors claiming the HL7 v2.5.1 Option shall implement the contents of this section. The Actor shall also support the Message Semantics described in 4.1.4.1.2.1.**~~

Actors shall implement the message semantics of ITI-31 for each trigger event specified in Section 4.1.4.1.1.

Modify Section 4.1.4.2.2.2 as shown below:

~~**Actors claiming the HL7 v2.5.1 Option shall implement the contents of this section. When an actor claims support for the HL7 v2.5.1 Option the Actor is required to support the HL7 v2.5.1 interface requirements described in the referenced volumes and sections. The Actor shall still support the HL7 v2.3.1 version of the transactions.**~~

The RAD-1 Patient Management-Cancel Admit/Register Patient transaction is implemented by the ~~**ITI PAM**~~ ITI-31 "Patient Encounter Management" triggers events and related messages:

Modify Section 4.2.4.1.2.2 as shown below:

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~~**Actors claiming the HL7 v2.5.1 Option shall implement the contents of this section. When an actor claims support for the HL7 v2.5.1 Option the Actor is required to support the HL7 v2.5.1 interface requirements described in the referenced volumes and sections. The Actor shall still support the HL7 v2.3.1 version of the transactions.**~~

The HL7 v2.5.1 ~~**Option**~~ **Message Semantics** implements the Chapter 4 OMG message. Refer to the HL7 Standard for general message semantics.

Note: Additional qualifications to the level of specification and HL7 profiling are stated in Section 2.3.

Modify Section 4.2.4.1.3 as shown below:

4.2.4.1.3 Expected Actions

Department System Scheduler/Order Filler shall accept the order information for fulfillment. If error in data prevents it from fulfilling the order, it shall notify the Order Placer by returning proper information in the ACK message.

For actors ~~**claiming**~~ **implementing** the HL7 v2.5.1 **Message Semantics**~~**Option**~~, the Order Placer shall not change an order that has already been started, e.g., one for which Order Filler has transmitted an "In-Progress" status in the Order Status message in the RAD-3 transaction (see Section 4.3.4.2). However, if the Order Filler receives the change order message after it has sent the Order Status Update message (for example, in a case of a race condition between two messages), Order Filler shall accept the change order and perform transaction RAD-13 Procedure Update to notify Image Manager.

Modify Section 4.2.4.2.2.2 as shown below:

~~**Actors claiming the HL7 v2.5.1 Option shall implement the contents of this section. When an actor claims support for the HL7 v2.5.1 Option the Actor is required to support the HL7 v2.5.1 interface requirements described in the referenced volumes and sections. The Actor shall still support the HL7 v2.3.1 version of the transactions.**~~

The HL7 v2.5.1 **Message Semantics implement the** ~~**Chapter 4**~~ OMG message. Refer to **the** HL7 standard for general message semantics. Refer to Section 4.2.4.1.2.**2**~~**6**~~ above for detailed requirements of the OMG message.

Modify Section 4.3.2 as shown below:

Actor: Order Placer

Role: Receives new order, order change (HL7 v2.5.1 **Message Semantics** ~~**option**~~) and order cancellation requests from Order Filler. Receives Order Status updates from Order Filler.

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Modify Section 4.3.4.1.1 as shown below:

4.3.4.1.1 Trigger Events

ORM - Department system Scheduler/Order Filler places an order (control code = SN).

ORR – Order Placer replies (control code = NA).

~~Systems~~ Actors ~~claiming~~ implementing the HL7 v2.5.1 **~~Option~~ Message Semantics** shall implement the following:

OMG - Department system Scheduler/Order Filler places an order (control code = SN) or changes an order (control code = XX).

ORG – Order Placer replies (control code = NA).

The ORR (HL7 v2.3.1) or ORG (HL7 v2.5.1) messages are sent by the Order Placer to convey the Order Placer Number in those cases where the DSS/Order Filler places the Order. ORR messages shall not be used as acknowledgements in other cases.

Modify Section 4.3.4.1.2.2 as shown below:

~~Actors claiming the HL7 v2.5.1 Option shall implement the contents of this section. When an actor claims support for the HL7 v2.5.1 Option the Actor is required to support the HL7 v2.5.1 interface requirements described in the referenced volumes and sections. The Actor shall still support the HL7 v2.3.1 version of the transactions.~~

The HL7 v2.5.1 **Message Semantics implement the~~Chapter 4~~** OMG message. Refer to the HL7 Standard for general message semantics. Refer to Section 4.2.4.1.2.2 above for detailed requirements for the OMG message.

Modify Section 4.3.4.2.1 as shown below:

4.3.4.2.1 Trigger Events

ORM - Department System Scheduler/Order Filler updates an order status (control code = SC).

~~Systems~~ Actors ~~claiming~~ implementing the HL7 v2.5.1 **~~Option~~ Message Semantics** shall implement the following:

OMG - Department System Scheduler/Order Filler updates an order status (control code = SC).

Modify Section 4.3.4.2.2.2 as shown below:

~~Actors claiming the HL7 v2.5.1 Option shall implement the contents of this section. When an actor claims support for the HL7 v2.5.1 Option the Actor is required to support the HL7~~

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~~**v2.5.1 interface requirements described in the referenced volumes and sections. The Actor shall still support the HL7 v2.3.1 version of the transactions.**~~

The HL7 v2.5.1 **Message Semantics implement the**~~**Chapter 4**~~ OMG message. Refer to **the** HL7 Standard for general message semantics.

Modify Section 4.3.4.3.1 as shown below:

4.3.4.3.1 Trigger Events

ORM – Department System Scheduler/Order Filler cancels the order previously received from Order Placer (control code = OC).

Actors ~~**claiming**~~ **implementing** the HL7 v2.5.1 ~~**Option**~~ **Message Semantics** shall implement the following trigger event:

OMG – Department System Scheduler/Order Filler cancels the order previously received from Order Placer (control code = OC).

Modify Section 4.3.4.3.2.2 as shown below:

~~**Actors claiming the HL7 v2.5.1 Option shall implement the contents of this section.**~~

The HL7 v2.5**.1 Message Semantics implement the**~~**Chapter 4**~~ OMG message. Refer to the HL7 standard for general message semantics. Required segments are listed below. Other segments are optional.

Modify Section 4.3.4.3.3 as shown below:

4.3.4.3.3 Expected Actions

After receiving the ORM message (or OMG message if ~~**claiming**~~ **implementing** the HL7 v2.5.1 ~~**Option**~~**Semantics**) with the control code OC, Order Placer shall process the order the same way as if it was cancelled/discontinued by the Order Placer.

Modify Section 4.4.4.1.2.2 as shown below:

~~**Actors claiming the HL7 v2.5.1 Option shall implement the contents of this section. When an actor claims support for the HL7 v2.5.1 Option the Actor is required to support the HL7 v2.5.1 interface requirements described in the referenced volumes and sections. The Actor shall still support the HL7 v2.3.1 version of the transactions.**~~

The HL7 v2.5.1 Message Semantics implement the OMG message. Refer to the HL7 Standard for general message semantics. Refer to Section 4.2.4.1.2.2 above for detailed requirements for the OMG message.

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The Department System Scheduler/Order Filler uses an OMI message to convey necessary procedure and scheduling information.

Modify the title for Figure 4.4-15 to match the other dozen (i.e., no specific version reference)

Table 4.4-15: DSS mappings of the OBR Segment ~~(HL7 v2.5.1 Option)~~

Move the trigger statement in 4.12.4.1.2 as shown below:

An A02 event is issued as a result of the patient changing his or her assigned physical location.

The message shall be generated by the system that performs the update whenever an error is resolved or a change occurs in patient location.

4.12.4.1.2 Message Semantics

The Update Patient transaction is an HL7 ADT message. ~~**The message shall be generated by the system that performs the update whenever an error is resolved or a change occurs in patient location.**~~

Move the trigger statement in 4.12.4.3.2 as shown below:

4.12.4.3.1 Trigger Events

Changes to patient demographics and account information (e.g., change in patient name, patient address, etc.) shall trigger the following Update Patient message:

- A08 – Update Patient Information

The message shall be generated by the system that performs the update whenever an error is resolved or a change occurs in patient demographics.

4.12.4.3.2 Message Semantics

The Update Patient transaction is an HL7 ADT message. ~~**The message shall be generated by the system that performs the update whenever an error is resolved or a change occurs in patient demographics.**~~

Modify the title for Figure 4.12-18 to match the rest (no specific version reference)

Table 4.12-18: IHE Profile - MRG segment ~~(HL7 v2.5.1 Option)~~

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Modify Section 4.12.4.5.2.2 as shown below:

For ~~**the**~~ HL7 v2.5.1 ~~**Option**~~, the messages used to communicate the Cancel Patient Transfer/Discharge messages are described in the following ITI Sections in the ITI Technical Framework sections:

- ITI TF-**2b**~~**B**~~:3.31.7.12 Cancel Patient Transfer (ADT^A12^ADT_A12)
- ITI TF-2**b**~~**B**~~:3.31.7.5 Cancel Discharge/End Visit (ADT^A13^ADT_A01)

Modify Section 4.13.1 as shown below:

4.13.1 Scope

This transaction involves changes to procedure information communicated from the Department System Scheduler to the Image Manager and Report Manager. Unlike the order message sent between the Order Placer and Order Filler (where only the order status can be updated without requiring a Cancel/New Order to change an order), the ORM or OMI ~~**(HL7 v2.5.1 Option)**~~ message from the Department System Scheduler/Order Filler and Image Manager may reference a previously scheduled Requested Procedure identified by a Study Instance UID.

Modify Section 4.13.4.2.2 as shown below:

~~**Actors claiming the HL7 v2.5.1 Option shall implement the contents of this section. When an actor claims support for the HL7 v2.5.1 Option the Actor is required to support the HL7 v2.5.1 interface requirements described in the referenced volumes and sections. The Actor shall still support the HL7 v2.3.1 version of the transactions.**~~

The Procedure Update message is conveyed by the HL7 OMI message formatted according to the rules described in Section 4.4.

Modify Appendix E as shown below:

Appendix E – HL7 Version 2.3.1 Message Field Replaced with HL7 Version 2.5.1 Summary

This appendix provides for a summary of the overloaded and/or obsolete message fields profiled in the HL7 v2.3.1 message semantics in this Technical Framework and the replacement message fields profiled in the HL7 v2.5.1 **message semantics**~~**Option**~~. Note that the original semantics specified by IHE Radiology are maintained when implementing HL7 v2.5.1. Refer to the transaction description in the Technical Framework for the detailed description. This table is provided for your reference.

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