

Integrating the Healthcare Enterprise



5 **IHE Quality, Research and Public Health
(QRPH)
Technical Framework**

10 **Volume 1
IHE QRPH TF-1
Profiles**

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140 **1 Introduction**

This document, Volume 1 of the IHE Quality, Research and Public Health (QRPH) Technical Framework, describes the clinical use cases, actors, content module, and transaction requirements for the Quality, Research and Public Health profiles.

1.1 Introduction to IHE

145 Integrating the Healthcare Enterprise (IHE) is an international initiative to promote the use of standards to achieve interoperability among health information technology (HIT) systems and effective use of electronic health records (EHRs). IHE provides a forum for care providers, HIT experts and other stakeholders in several clinical and operational domains to reach consensus on standards-based solutions to critical interoperability issues.

150 The primary output of IHE is system implementation guides, called IHE profiles. IHE publishes each profile through a well-defined process of public review and Trial Implementation and gathers profiles that have reached Final Text status into an IHE Technical Framework, of which this volume is a part.

155 For general information regarding IHE, refer to www.ihe.net. It is strongly recommended that, prior to reading this volume, the reader familiarizes themselves with the concepts defined in the *[IHE Technical Frameworks General Introduction](#)*.

1.2 Introduction to IHE Quality, Research and Public Health (QRPH)

160 The IHE Quality, Research and Public Health (QRPH) domain addresses the information exchange and electronic health record content standards necessary to share information relevant to quality improvement in patient care, clinical research and public health monitoring.

Clinical, demographic and financial information is routinely gathered and used in the process of providing clinical care. This information has significant value to public health agencies for monitoring disease patterns of known clinical processes (including incidence, prevalence and situational awareness) and for identifying new patterns of disease. Such data may be used to
165 develop population analyses and programs for direct outreach and condition management through registries and locally determined appropriate treatment programs or protocols.

Similarly, information about care processes delivered to patients can be used to identify adherence to expected evidence-based clinical care protocols and to assess outcomes and quality of care provided by individual clinicians or groups of clinicians. Much of the data required for
170 quality analysis exists within the clinical patient record and can be repurposed for analysis. The protocols for subsequent management of clinicians and individual patients with respect to quality data are often addressed as performance improvement or disease management initiatives.

175 Research and clinical studies, likewise, require identification of patterns of clinical presentation to select patients for inclusion (with consent) in research protocols. Subsequent study execution requires infrastructure and detailed content gathering capabilities similar to those required by quality initiatives and public health.

180 The QRPH domain addresses specifications for patient selection, individual and aggregate data reporting, and privacy and security constraints for re-use of patient information, enabling experts in health quality, research and public health to collaborate and coordinate their activities.

1.3 Intended Audience

The intended audience of IHE Technical Frameworks Volume 1 (Profiles) is:

- Those interested in integrating healthcare information systems and workflows
- IT departments of healthcare institutions
- 185 • Technical staff of vendors participating in the IHE initiative

1.4 Prerequisites and Reference Material

For more general information regarding IHE, refer to www.ihe.net. It is strongly recommended that, prior to reading this volume, the reader familiarizes themselves with the concepts defined in the *[IHE Technical Frameworks General Introduction](#)*.

190 Additional reference material available includes:

1.4.1 Actor Descriptions

Actors are information systems or components of information systems that produce, manage, or act on information associated with operational activities in the enterprise.

195 A list of actors defined for all domains and their brief descriptions can be found as [Appendix A](#) to the *IHE Technical Frameworks General Introduction*.

1.4.2 Transaction Descriptions

Transactions are interactions between actors that transfer the required information through standards-based messages.

200 A list of transactions defined for all domains, their transactions numbers, and a brief description can be found as [Appendix B](#) to the *IHE Technical Frameworks General Introduction*.

1.4.3 Content Modules

Content modules are data and data definitions shared between actors.

205 In the future, a list of content modules defined for all domains, their reference numbers, and a brief description can be found as Appendix G to the *IHE Technical Frameworks General Introduction*.

1.4.4 IHE Integration Statements

IHE Integration Statements provide a consistent way to document high level IHE implementation status in products between vendors and users.

210 The instructions and template for IHE Integration Statements can be found as [Appendix F](#) to the *IHE Technical Frameworks General Introduction*.

IHE also provides the IHE Product Registry (http://www.ihe.net/IHE_Product_Registry) as a resource for vendors and purchasers of HIT systems to communicate about the IHE compliance of such systems. Vendors can use the Product Registry to generate and register Integration Statements.

215 **1.5 Overview of Technical Framework Volume 1**

Volume 1 is comprised of several distinct sections:

- Section 1 provides background and reference material.
- Section 2 presents the conventions used in this volume to define the profiles.
- Sections 3 and beyond define Quality, Research and Public Health profiles, actors, and requirements in detail.

220

The appendices in Volume 1 provide clarification of uses cases or other details. A glossary of terms and acronyms used in the IHE Technical Framework is provided in [Appendix D](#) to the *IHE Technical Frameworks General Introduction*.

1.6 Comment Process

225 IHE International welcomes comments on this document and the IHE initiative. Comments on the IHE initiative can be submitted by sending an email to the co-chairs and secretary of the Quality, Research and Public Health domain committees at qrph@ihe.net Comments on this document can be submitted at http://ihe.net/QRPH_Public_Comments.

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240 the scope of this IHE document and would have to be obtained from that other party.

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1.10 History of Document Changes

This section provides a brief summary of changes and additions to this document.

Date	Document Revision	Change Summary
2011-09-02	0.1	Initial Trial Implementation version (no Final Text profiles)
2018-10-19	1.0	Initial Final Text version including CRD and DSC Profiles
2019-07-05	2.0	Added the NANI Profile.

¹ HL7 is the registered trademark of Health Level Seven International.

2 Quality, Research and Public Health Integration Profiles

275 IHE Integration Profiles offer a common language that healthcare professionals and vendors can use to discuss integration needs of healthcare enterprises and the integration capabilities of information systems in precise terms. Integration Profiles specify implementations of standards that are designed to meet identified clinical needs. They enable users and vendors to state which IHE capabilities they require or provide, by reference to the detailed specifications of the IHE Quality, Research and Public Health Technical Framework.

280 IHE Integration Profiles are defined in terms of IHE actors (defined in Volume 1), transactions (defined in Volume 2), and content modules (defined in Volume 3). Actors are information systems or components of information systems that produce, manage, or act on information associated with clinical and operational activities in healthcare. Transactions are interactions between actors that communicate the required information through standards-based messages. Content modules define how the content used in a transaction is structured. A content module is 285 specified so as to be independent of the transaction in which it appears.

Vendor products support an Integration Profile by implementing the appropriate actor(s) and transactions. A given product may implement more than one actor and more than one integration profile.

290 IHE profiles which have reached the status of *Final Text* are published as part of the domain's Technical Framework Volumes 1-4. Prior to Final Text status, IHE profiles are published independently as *Profile Supplements* with the status of *Public Comment* or *Trial Implementation*.

295 For a list and short description of Quality, Research and Public Health profiles, see https://www.ihe.net/ihe_domains/quality_research_and_public_health/. The list includes all of the profiles in this document (Final Text) and may include profiles in the Trial Implementation stage.

2.1 Required Actor Groupings and Bindings

The IHE Technical Framework relies on the concepts of *required actor groupings* and *bindings*.

300 Required actor groupings may be defined between two or more IHE actors. Actors are grouped to combine the features of existing actors. This allows reuse of features of an existing actor and does not recreate those same features in another actor. Internal communication between grouped actors is not specified by IHE. An example of grouped actors in the IHE Radiology Scheduled Workflow Profile is the grouping between the Image Manager and Image Archive.

305 Additionally, required actor groupings may cross profile boundaries. For example, an XDS Document Registry is required to be grouped with an ATNA Secure Node. Required actor groupings are defined in each profile definition in Volume 1. To comply with an actor in an IHE profile, a system must perform all transactions required for that actor in that profile. Actors supporting multiple Integration Profiles must support all of the transactions of each profile. (Note: In previous versions of IHE Technical Framework documents, the concept of profile

310 dependencies existed. For simplification, profile dependencies have been combined with
required actor groupings and are enumerated/repeated within each profile in Volume 1.)

Bindings refer to content modules. Bindings map data from a content module to the metadata of
a specific transport profile. Bindings for content modules, and the associated concepts, are
defined in Volume 3.

315 **2.2 Security Implications**

IHE transactions often contain information that must be protected in conformance with privacy
laws, regulations and best practices. This protection is documented in the Security
Considerations section of each profile, which communicates security/privacy concerns that the
implementers need to be aware of, assumptions made about security/privacy pre-conditions and,
320 where appropriate, key elements of a risk mitigation strategy to be applied.

2.3 Integration Profiles Overview

An overview of the profiles is listed at <http://www.ihe.net/Profiles>.

2.4 Product Implementations

325 As described in detail in the [IHE Technical Frameworks General Introduction](#), an implementer chooses specific profiles, actors, and options to implement for their product. To comply with an actor in an IHE profile, a system must perform all the required transactions required for that actor in that profile.

330 To communicate the conformance of a product offering with IHE profiles, implementers provide an IHE Integration Statement describing which IHE integration profiles, IHE actors and options are incorporated.

335 Further discussion about integration statements and a sample form can be found in [Appendix F](#) to the *IHE Technical Frameworks General Introduction*. To make consumers aware of the product integration statement, enter it in the IHE Product Registry (<http://product-registry.ihe.net/>).

3 Clinical Research Document (CRD) Profile

The Clinical Research Document Profile (CRD) specifies a standard way to generate a clinical research document from EHR data provided in the CDA^{®2} standard.

340 While the profile does not mandate the use of the CDASH standard, it provides guidance on how this profile could incorporate transformation of CDA content into CDASH.

The profile uses the transaction framework defined in the IHE ITI Retrieve Form for Data Capture (RFD) Profile. It further constrains the prepopData and workflowData data elements of the Retrieve Form [ITI-34] transaction in order to optimize the pre-population of the form used
345 to collect the data during a patient's visit on an investigation site and an optional functionality is more tightly specified as required.

The CRD Profile uses the Archive Source Documents [QRPH-36] transaction to enable the CRD actors to meet data auditing requirements of the FDA when creating clinical research documents. It enables a Form Filler, which provides a pre-population document and some workflow data
350 when retrieving a form, to archive the pre-population document it supplied.

The profile also enables FDA security requirements by optionally grouping CRD actors with actors in the IHE ITI Consistent Time (CT), Audit Trail and Node Authentication (ATNA), or Cross-Enterprise User Assertion (XUA) Profiles. See Section 3.5 Security Considerations.

In summary, the CRD Profile is just like the RFD Profile except it is more specific about the pre-population xml requirements used when retrieving a form, some optional functionality is more
355 tightly specified as required, a new transaction is created and is used to facilitate the archiving of the pre-population data, and other actor's groupings are added to enhance the security of CRD actors.

3.1 CRD Actors, Transactions, and Content Profiles

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

Figure 3.1-1 shows the actors directly involved in the CRD Profile and the relevant transactions between them. If needed for context, other actors that may be indirectly involved due to their
365 participation in other related profiles are shown in dotted lines. Actors which have a required grouping are shown in conjoined boxes (see Section 3.3).

² CDA is the registered trademark of Health Level Seven International.

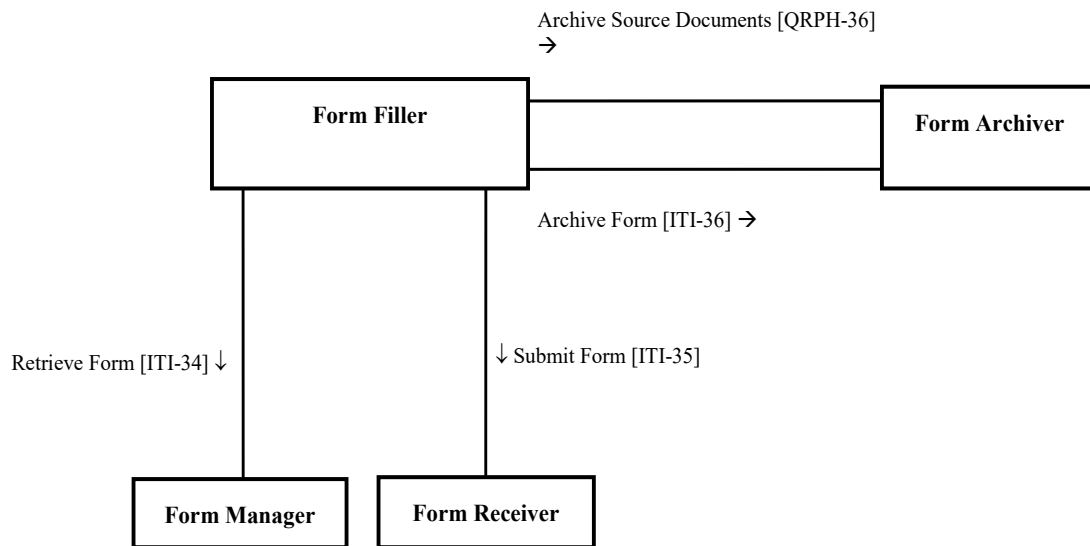


Figure 3.1-1: CRD Actor Diagram

370 Table 3.1-1 lists the transactions for each actor directly involved in the CRD Profile. To claim compliance with this profile, an actor shall support all required transactions (labeled “R”) and may support the optional transactions (labeled “O”).

Table 3.1-1: CRD Profile - Actors and Transactions

Actors	Transactions	Initiator or Responder	Optionality	Reference
Form Filler	Retrieve Form	Initiator	R	ITI TF-2b: 3.34
	Archive Source Documents	Initiator	O	QRPH TF-2: 3.36
	Submit Form	Initiator	R	ITI TF-2b: 3.35 (See Note 1)
	Archive Form	Initiator	O	ITI TF-2b: 3.36 (See Note 2)
Form Manager	Retrieve Form	Responder	R	ITI TF-2b: 3.34
Form Receiver	Retrieve Form	Responder	R	ITI TF-2b: 3.35
Form Archiver	Archive Source Documents	Responder	R	QRPH TF-2: 3.36
	Archive Form	Responder	R	ITI TF-2b: 3.36

Note 1: This transaction is further constrained in this profile (see QRPH TF-3: 6.3.1.2).

375 Note 2: This transaction is further constrained in this profile (see QRPH TF-3: 6.3.1.2).

Table 3.1-1 lists the content module(s) defined in the CRD Profile. To claim support with this profile, an actor shall support all required content modules (labeled “R”) and may support optional content modules (labeled “O”).

Table 3.1-2: CRD – Actors and Content Modules

Actors	Content Modules	Optionality	Reference
Form Filler	CRD Prepop data document (creator)	R	QRPH TF-3: 6.3.1.D
	CRD Workflow data (creator)	R	QRPH TF-3: 6.3.1.D1
Form Manager	CRD Prepop data document (consumer)	R	QRPH TF-3: 6.3.1.D
	CRD Workflow data (consumer)	R	QRPH TF-3: 6.3.1.D1
Form Archiver	CRD Prepop data document	O	QRPH TF-3: 6.3.1.D
	CRD Workflow data	O	QRPH TF-3: 6.3.1.D1
Form Receiver	CRD Workflow data (creator)	R	QRPH TF-3: 6.3.1.D1

380

3.1.1 Actor Descriptions and Actor Profile Requirements

Most requirements are documented in Transactions (Volume 2) and Content Modules (Volume 3). This section documents any additional requirements on profile’s actors.

3.1.1.1 Form Filler

385 In addition to its role as defined in the RFD Profile in ITI TF-1:17, the Form Filler SHALL support the generation of the pre-population data in the form of the two content modules hereafter named “CRD prepop data” and “CRD workflow data”.

3.1.1.2 Form Manager

390 In addition to its role as defined in the RFD Profile in ITI TF-1:17, the Form Manager MAY specify mappings between CCD and CDASH. While the profile does not mandate the use of the CDASH standard, it provides guidance on how this profile could incorporate transformation of CDA content into CDASH.

3.1.1.3 Form Receiver

395 The role of the Form Receiver in this profile is the one defined in the RFD Profile in ITI TF-1:17.

3.1.1.4 Form Archiver

The role of the Form Archiver in this section is the one defined in the RFD Profile in ITI TF-1:17.

3.2 CRD Actor Options

400 Options that may be selected for each actor in this profile, if any, are listed in the Table 3.2-1. Dependencies between options, when applicable, are specified in notes.

Table 3.2-1: CRD – Actors and Options

Actor	Option Name	Reference
Form Filler	Archive Source Documents	QRPH TF-2: 3.36
	Archive Form	ITI TF-2b: 3.36
Form Manager	None	
Form Receiver	None	
Form Archiver	None	

405 Note: In the CRD Profile, the pre-population data is not an option; it is required as the profile is precisely about defining it. The CRD Profile requires that this prepop and workflow data conform to the xml data constrained in QRPH TF-3: 6.3.1.D and 6.3.1.D1. The “Archive Source Documents” Option requires the Form Filler to submit the Prepop and Workflow data to the Form Archiver through the [QRPH-36] transaction. If the Form Filler supports this option, that transaction must be completed first in order to provide the Form Manager with the context id related to the archived CRD (see QRPH TF-3: 6.3.1.D1).

3.3 CRD Required Actor Groupings

410 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 requirements for the grouped actor (Column 2).

Table 3.3-1: CRD – Required Actor Groupings

CRD Actor	Actor(s) to be grouped with	Reference	Content Bindings Reference
Form Filler	None	--	--
Form Manager	None	--	--
Form Receiver	None	--	--
Form Archiver	None	--	--

415 3.4 CRD Overview

3.4.1 Concepts

3.4.2 Use Cases

3.4.2.1 Use Case #1: Clinical Trial Visit

420 We are in the setting of a clinical study which implies a certain number of visits for all the patients involved. A patient enrolled in a clinical study comes to the Hospital for a visit related to that clinical study.

3.4.2.1.1 Clinical Trial Visit Use Case Description

425 The setting for the clinical research use case is a physician practice where patient care is
delivered side-by-side with clinical research activities. The site, Holbin Medical Group, is a
multi-site physician practice, employing over 100 physicians in a variety of specialties. Holbin's
CEO encourages the physicians to participate as site investigators for pharmaceutical-sponsored
clinical trials; Holbin provides support for clinical research activities in the form of a Research
Department of twelve dedicated study coordinators, mostly RNs, along with clerical and data-
entry support personnel. Holbin Medical Group uses an Electronic Medical Record (EMR) and a
430 number of sponsor-provided Electronic Data Capture (EDC) systems for documenting clinical
trial activities. EDC is a system for documenting clinical trial activities. EDC is a remote data
entry system, provided by the research sponsor, which uses either a laptop (thick or thin client)
or a web site. For our purposes, an EMR is any application which is the primary site for
documenting patient care and retrieving patient care information. Thus, we include in our span of
435 interest many systems installed today that are not quite EMRs in the strictest sense, but which
would still benefit from this approach.

Holbin's involvement in a clinical study begins when the Research Department receives a
request for proposal (RFP) or a request for a feasibility assessment (EU) from a study Sponsor.
The Investigator or the Study Coordinator, Patricia Zone, RN, evaluates the RFP to assess if their
440 facility has the required patient population (clinical condition and required numbers required by
the study protocol) as specified in the clinical study protocol, as well as the business viability. A
major issue that must be addressed is the time needed to perform the clinical study and whether
or not the site has the time to perform the study appropriately. Once these concerns are addressed
satisfactorily and the site is selected for the trial, the financial aspects are addressed and the site
445 then sends the required regulatory documentation to the Sponsor. The Sponsor then provides
Protocol-specific training to the Physician Investigator and other study personnel.

During the trial set-up period, Patricia, together with the Investigator ensures that the appropriate
system security is in place for this protocol, recruits patients to participate as subjects according
to inclusion and exclusion criteria described in the study protocol schedules patient visits,
450 manages data capture and data entry, ensures that IRB approval has been obtained, maintains
required regulatory documents and performs all the attendant financial tasks.

Patricia, under the supervision of the Investigator contacts Corey Jones, a patient at Holbin,
about participating in the trial and Corey agrees to participate as a subject. Patricia registers
Corey in the EMR as a subject in trial #1234, using the EMR's patient index. She schedules
455 Corey's study visits using the EMR scheduling module, and flags the visits as pertaining to the
trial #1234. After the set-up stage, the site initiates clinical trial care and trial-specific
documentation.

The use case continues with current state and desired state scenarios, which describe data capture
utilizing EDC technology during a patient clinical trial visit before and after the RFD
460 implementation.

3.4.2.1.1 Current State

465 Mrs. Corey Jones arrives at the clinic for a scheduled trial visit and meets with Patricia Zone (Registered Nurse) for a face-to-face interview. Patricia logs into the EMR and documents the visit with a terse entry: ‘Mrs. Jones comes in for a clinical trial visit associated with study #1234.’ Patricia interviews Mrs. Jones, makes some observations, and records her observation on a source paper document. She looks up recent lab results in the EMR and records them in the Case Report Form (CRF). The EMR provides only a portion of the data required to complete the form, the rest comes from the interview and observations. (Estimates on the percentage of data required for a clinical trial that would be available in an EMR vary from 5% to 40%. Even in the best case, the EMR typically captures only a subset of the data required by a study protocol.)

475 The completed source document is forwarded to Bob Thomas, the data entry person. Bob identifies the CRF as belonging to trial #1234, and selects the trial #1234 EDC system, which MAY be housed on a dedicated laptop provided by the sponsor or MAY be accessible via a browser session connected to the Sponsor’s EDC system via the Internet. He takes a three-ring binder off the shelf and refers to his ‘crib sheet’ to get the instructions for how to use this particular system. He logs into the EDC application, using a user name and password unique to this system, and enters the data into the correct electronic case report form (eCRF) for that trial visit. Once the source documents have been processed, Bob files it in a ‘banker’s box’ as part of the permanent source record of the trial (in order to meet the requirements of the Federal Code of Regulations 21CFR 312:62).

485 In addition to trial #1234, Bob performs data entry on eight additional EDC systems, five on dedicated laptops and three that are web-based. The web-based EDC systems save on table space, but still require entries in the three ring binders where Bob puts his ‘crib sheets’. It is a chore to make sure that data from a particular trial gets entered into the corresponding laptop with its unique login ritual and data capture form, so Bob experiences much frustration in dealing with this unwieldy set of systems. Bob is a conscientious employee and stays current in his work. But in many other sites the data entry person holds the CRF for a period of time before entering the data, perhaps entering data twice a month, or entering the data the week before the monitor visit occurs.

490 3.4.2.1.1.2 Desired State

495 Mrs. Jones arrives for a visit and Patricia logs into the EMR, pulls up Mrs. Jones’s record, and identifies the scheduled clinical trial visit. Because of the patient identification and scheduling steps that took place in the set-up stage, and because Mrs. Jones informed consent indicated that it was permissible to do so, the EMR recognizes Mrs. Jones as a subject in Trial 1234 and requests an electronic case report form from trial #1234’s, using RFD. If the trial is sufficiently complex, the retrieved form MAY contain a list of relevant forms from the RFD Forms Manager system from which Patricia MAY choose. Patricia selects the appropriate form, the EMR checks Patricia’s credentials, confirms that consent to access the EMR data has been obtained and thus confirms that she is empowered to view the form, and displays the form. (The data capture form is essentially the same form that an EDC system would offer for this visit, and its presentation MAY take on some of the look and feel of the EMR’s user interface.)

505 Nurse Patricia interviews Mrs. Jones and enters data into the clinical trial form as presented in the EMR. The clinical site personnel will be well acquainted with the basic data collection variables⁴ that appear on the clinical trial form as they are consistently collected in all types/phases of clinical trials. Applicable data from the EMR database are now archived for future regulatory auditing and used to pre-populate some of the clinical trial data fields. Additional data MAY need to be captured interactively via the forms (which MAY have built-in edit checks). Upon completing the form, Patricia hits the submit button, and the EMR returns the complete form to the EDC system, using RFD. A copy of the document is archived in the site
510 clinical trial document vault as part of the permanent source record of the trial.

3.4.2.1.2 Clinical Trial Visit Process Flow

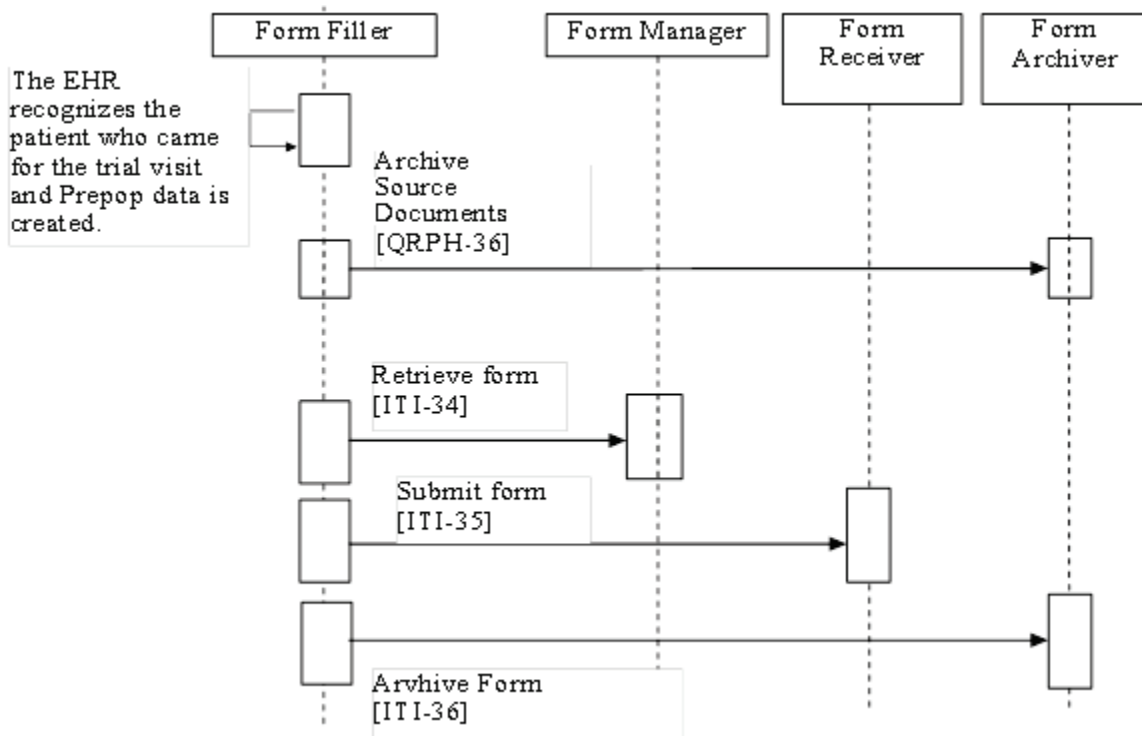


Figure 3.4.2.1.2-1: Basic Process Flow in CRD Profile

515 In this Process Flow, the Form Filler knows which form it wants to retrieve from the Form Manager. The Form Filler wants to send prepop and workflow data for this form. In addition, the Form Filler wants to archive the prepop and workflow data.

⁴ These clinical trial forms or domain modules are comprised of data collection variables identified by the Clinical Data Acquisition Standards Harmonization (CDASH) Initiative. The CDASH initiative identifies data collection fields that are applicable to all clinical trials regardless of therapeutic area or phase of trial. Additional data collection fields will have been added to the CDASH collection variables to capture the required therapeutic area or required fields by the study Sponsor.

3.5 CRD Security Considerations

3.5.1 Consistent Time (CT)

520 In order to address identified security risks all actors in CRD should be grouped with Consistent Time (CT) Profile – Time Client Actor. This grouping will assure that all systems have a consistent time clock to assure a consistent timestamp for audit logging and form accuracy.

3.5.2 Audit Trail and Node Authentication (ATNA)

525 In order to address identified security risks all actors in CRD may be grouped with Audit Trail and Node Authentication (ATNA) Profile – Secure Node or Secure Application Actors. This grouping may assure that security related events are recorded in the audit log and that only highly trusted systems can communicate.

3.5.3 Cross Enterprise User Assertion (XUA)

530 In order to address identified security risks all actors in CRD may be grouped with Cross-Enterprise User Assertion (XUA) Profile actors. The Form Filler would be the XUA X-Service User and the other actors would be the XUA X-Service Provider. These groupings support user-based access control.

3.6 CRD Cross Profile Considerations

Not applicable

535

4 Drug Safety Content (DSC) Profile

The Drug Safety Content Profile (DSC) specifies a standard way to generate an adverse event document from EMR data provided in the CDA standard.

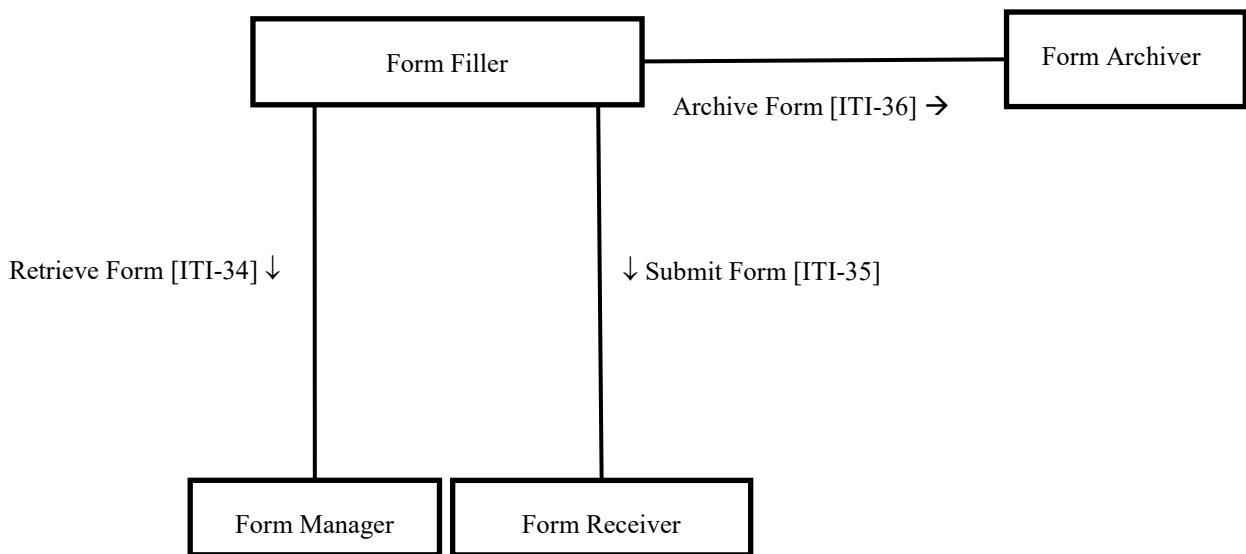
540 The profile uses the transaction framework defined in the RFD Profile. It further constrains the prepopData data elements of the RFD Retrieve Form transaction in order to optimize the pre-population of the form used to collect the data during a patient’s visit on an investigation site and an optional functionality is more tightly specified as required.

545 Other FDA requirements which this profile meets are security requirements. This is enabled by the grouping of each of the actors defined in this profile with a CT Time Client, an ATNA Secure Node or Application and an XUA X-Service User.

In Summary, the DSC Profile is just like the RFD Profile except it is more specific about the pre-population xml requirements used when retrieving a form, some optional functionality is more tightly specified as required and other actor’s groupings are added to enhance the security of the actors.

550 4.1 DSC Actors, Transactions and Content Modules

Figure 4.1-1 shows the actors directly involved in the DSC 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.



555 **Figure 4.1-1: DSC Actor Diagram**

Figure 4.1-1 shows the principal actors described (bold and solid boxes) in the DSC Integration Profile. Here there are no transactions per se between these actors as this profile is a content profile, but if there were some, they would be designed in bold and solid lines. The diagram also

560 shows actors which are not defined in this profile (dashed Boxes) but which SHALL be grouped with the principal ones.

As explained in the summary and shown in Table 4.3-1, the DSC actors SHALL also be grouped with some CT actors and SHOULD be grouped with some XUA and ATNA actors.. However, for clarity’s sake, it was decided not to show them in Figure 4.1-1, as this figure points out the most important features which this profile is about. An exhaustive DSC actor diagram can be found in Appendix A of this volume (see Figure A.1-1).

570 Table 4.1-1 lists the transactions for each actor directly involved in the DSC Profile. In order to claim support of this Profile, an implementation of an actor must perform the required transactions (labeled “R”) and MAY support the optional transactions (labeled “O”). Actor groupings are further described in Section 4.3.

Table 4.1-1: DSC Profile – Actors and Transactions

Actors	Transactions	Optionality	Section in Vol. 2
Form Filler	Retrieve Form	R	ITI TF-2b: 3.34
	Submit Form	R	ITI TF-2b: 3.35
	Archive Form	O	ITI TF-2b: 3.36
Form Manager	Retrieve Form	R	ITI TF-2b: 3.34
Form Receiver	Submit Form	R	ITI TF-2b: 3.35
Form Archiver	Archive Form	R	ITI TF-2b: 3.36

Table 4.1-2: DSC Profile – Actors and Content Modules

Actors	Content Module	Optionality	Section in Vol. 3
Form Filler	Case Report Document (creator)	R	3.Y1
Form Manager	Case Report Document (consumer)	R	3.Y1
Form Receiver	None	N/A	N/A

4.1.1 Actor Descriptions and Actor Profile Requirements

575 Normative requirements are typically documented in Volume 2 (Transactions) and Volume 3 (Content Modules). Some Integration Profiles, however, contain requirements which link transactions, data, and/or behavior. Those Profile requirements are documented in this section as normative requirements (“shall”).

4.1.1.1 Form Filler

580 In addition to its role as defined in the RFD Profile in ITI TF-1, the Form Filler SHALL support the generation of the pre-population data as defined in Volume 3, content requirements, hereafter named “Case Report Document.”

585 As described in Table 4.3-1, for security enhancing purposes, the Form Filler SHALL also be grouped with a CT Time Client. The Form Filler SHOULD be grouped with an XUA X-Service Provider and an ATNA Secure Node or ATNA Secure Application.

4.1.1.2 Form Manager

As described in Table 4.3-1, for security enhancing purposes, the Form Manager SHALL also be grouped with a CT Time Client. The Form Manager SHOULD be grouped with a XUA X-Service Provider and an ATNA Secure Node or ATNA Secure Application.

590 **4.1.1.3 Form Receiver**

The role of the Form Receiver in this profile is the one defined in the RFD Profile in ITI TF-1. It SHALL also be grouped with a CT Time Client. It SHOULD be grouped with a XUA X-Service Provider, and an ATNA Secure Node or ATNA Secure Application.

4.1.1.4 Form Archiver

595 The role of the Form Archiver in this section is the one defined in the RFD Profile in ITI TF-1. It SHALL also be grouped with a CT Time Client. It SHOULD be grouped with a XUA X-Service Provider, and an ATNA Secure Node or ATNA Secure Application.

4.2 DSC Actor Options

600 Options that may be selected for this profile are listed in the Table 4.2-1 along with the actors to which they apply. Dependencies between options when applicable are specified in notes.

Table 4.2-1: DSC – Actors and Options

Actor	Options	Volume & Section
Form Filler	Archive Form	ITI TF-2b:3.36
Form Manager	None	-
Form Receiver	None	-
Form Archiver	None	-

Note: Considering that we are in the DSC Profile, the pre-population data is not an option anymore; it is required as the profile is precisely about defining it. The DSC Profile requires that this prepop data conforms to the xml data constrained in its volume 3.

605 4.3 DSC Actor Required Groupings

Actor(s) which are required to be grouped with another actor(s) are listed in this section. The grouped actor may be from this profile or a different domain/profile. These mandatory required groupings, plus further descriptions if necessary, are given in the table below.

610 An actor from this profile (Column 1) must implement all of the required transactions in this profile in addition to all of the required transactions for the grouped profile/actor listed (Column 2).

Table 4.3-1: DSC – Required Actor Groupings

DSC Actor	Grouping Condition	Actor to be grouped with	Technical Framework Reference
Form Filler	Optional	ATNA Secure Node or ATNA Secure Application	ITI TF- 1: 9.4
	Required	CT Time Client	ITI TF- 1: 7.1
	Optional	XUA X-Service User	ITI TF- 1: 13.4
Form Manager	Optional	ATNA Secure Node or ATNA Secure Application	ITI TF- 1: 9.4
	Required	CT Time Client	ITI TF- 1: 7.1
	Optional	XUA X-Service Provider	ITI TF- 1: 13.4
Form Receiver	Optional	ATNA Secure Node or ATNA Secure Application	ITI TF- 1: 9.4
	Required	CT Time Client	ITI TF- 1: 7.1
	Optional	XUA X-Service Provider	ITI TF- 1: 13.4
Form Archiver	Optional	ATNA Secure Node or ATNA Secure Application	ITI TF- 1: 9.4
	Required	CT Time Client	ITI TF- 1: 7.1
	Optional	XUA X-Service Provider	ITI TF- 1: 13.4

4.4 DSC Overview

615 4.4.1 Concepts

Not applicable

4.4.2 Use Cases

4.4.2.1 Use Case #1: Clinical Trial Adverse Event (AE) Reporting

620 This use case demonstrates how the DSC Profile can be used to report an adverse event in the context of a clinical trial.

4.4.2.1.1 Clinical Trial Adverse Event (AE) Reporting Use Case Description

625 A physician, Dr. Smith, is seeing his first clinical trial patient, Rita Jones, for her trial visit. As he talks to her he is reviewing her clinical data in the clinical trial management software used by his practice. After discussing her progress over the last two weeks on the trial, she describes a pain in her abdomen that wasn't present until she started the trial drug for her heart condition. Dr. Smith notices an unanticipated increase in her amylase level and decides this could be due to the trial drug, as this is the second case with similar symptoms he's seen in the last week.

630 He chooses a menu item from the software to 'Report AE' and a form appears in which he selects the information to include in the report. Ms. Jones' labs, medications, demographics, physical exam and current complaint information are added into the form automatically. Dr. Smith adds some additional information on his suspicions in a text box on the form and pushes 'Report this AE', and the form disappears from his screen.

635 Dr. Smith recalls the time prior to using the automated reporting process and remembers how he would want to report an event like this, but after finishing seeing his patients, doing paperwork and getting lunch, he would only remember a few of the case details, and he never remembered where he could find a copy of the form to report the event. If he ran into his study nurse he would tell her the bare details of the case and ask her to report it, but that was as much as he was able to do given his schedule.

640 With this new system, he was confident that the case had the relevant clinical information, and he could add his interpretation of the case during the patient visit, while the impressions were fresh in his mind. The entire process usually took him only a few minutes to complete and he knew that the report would be complete and of high quality. He also knew that he could call the report up whenever he wished to review it in light of new information or similar cases.

645 **4.4.2.1.2 Clinical Trial Adverse Event Process Flow**

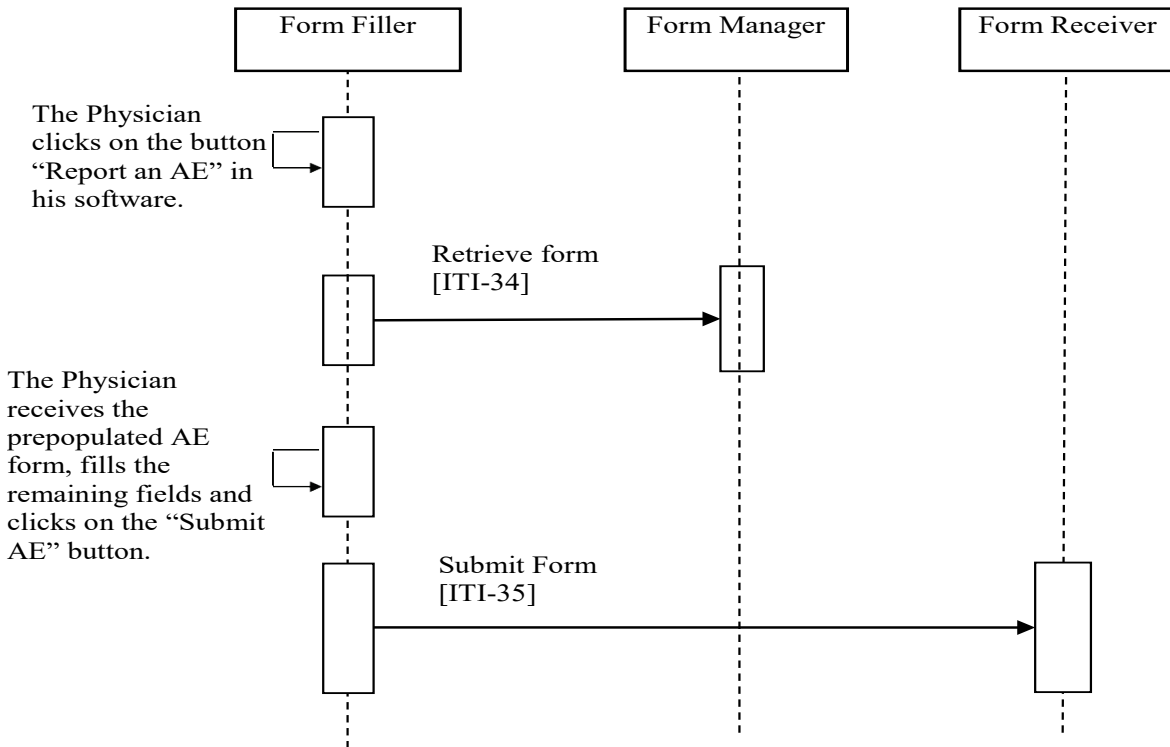


Figure 4.4.2.1.2-1: Basic Process Flow in DSC Profile used in the context of a Clinical Trial Adverse Event Reporting

650 **4.4.2.1.3 Current State**

Currently in the U.S., Europe, and Japan, adverse drug events (ADEs) and adverse drug reactions (ADRs), here generally referred to as adverse events (AEs), are collected on drugs (here meant to include both exogenous chemical and endogenous or ‘biologics’) through all phases of clinical trials and after the drug has been approved for marketing, through to the life of the drug on the market. There are some differences in regulations, practices and systems by geographic region, but certain commonalities remain:

Clinical Trial

- During clinical trial (CT) investigations, objectives include AEs as a safety component, one aspect of which is the reporting out of AEs during the trial. Certain types of AEs, classified as ‘serious’ by regulatory definition, must be reported according to a strict timeline and cannot wait until the completion of the trial. Data and information on these events must be collected, evaluated and sent to regulatory authorities by the principal investigator in a timely fashion. Currents methods of reporting range from a completion of a simple paper form by the principal investigator or a designee based on data captured in case record forms, visits and phone calls with medical personnel, to initial population

670 of data directly from trial management systems and electronic medical records (EMRs) used at the trial sites followed by assessment and refining of the information by designated personnel. A significant issue with all AE reporting from clinical trials involves the myriad number of clinical data storage systems, standards and data mappings and translations needed to get the data from the parent system to the regulators in a timely fashion.

Phase IV Trial

- 675 • One frequent source of post-marketing AEs comes from trials undertaken once the drug is on the market. These trials can range from Phase IV trials in which there is some type of case control or other means of control and a formal protocol to more loosely controlled trials (commonly referred to as ‘marketing trials’ in which there is a very general protocol). Phase IV trials are often performed to test the safety and effectiveness of new indications for drugs approved for more limited clinical use. The more well-controlled the trial, the more the data collection and reporting requirements resemble that of pre-marketing CTs. But in marketing trials, data may be collected from various means -
680 through phone interviews, surveys, emails, and from a very large number of consumers/patients. In these trials the quality and amount of data collection can vary tremendously.
- 685 • A common thread in all AE reporting is the heterogeneity of the systems and stakeholders in the process. This creates a large number of possible forms, interfaces and data translation requirements which increase the friction between the participants - from the original reporter all the way through to the regulator.

690 The current post marketing reporting process in the U.S. is largely paper-based and requires people to track down paper or .pdf forms which take anywhere from 30 to 45 minutes to complete. In Europe some countries have specialized reporting of AEs from, e.g., general practitioners, but there are common technological challenges with maintaining reporting forms and decreasing the burden of producing a report remains problematic. In other countries the process is similar to the U.S., with similar issues. Beyond the initial report, because of the number of handoffs in the process, the different
695 requirements of the various data processing systems involved, and the various requirements for data privacy, a standardized means of defining and moving data through the process is also needed - a commonly recognized format and process can greatly improve how post marketing reports are created and received in the future. Such transmission, privacy and security concerns are not in the direct scope of this profile
700 which specifically addresses the content of the message.

4.4.2.1.4 Desired State

705 Given the heterogeneous environment for AE collection and reporting, it is highly desirable to provide some more efficient way to move the data through the reporting system so that the act of reporting becomes easier as a routine output of usual clinical care processes, data fidelity can be maintained, reporting can be timely, and the number of translations of data that occur can be reduced to a minimum.

710 In clinical trials, an investigator should be able to use a single process to report AEs across any CTs and should not have to remember or transcribe data that already exists in the clinical systems. Additionally, to improve the reporting process, maintenance of data required for reporting should be accomplished without modification of each underlying data source system, especially given the large number of systems used in generating the data at the sites, in managing the trials, in processing the data at the manufacturers, and in receiving the data at the regulators. Standardization of data collection instruments and avoidance of duplicate data entry and transcription is similarly a desire for post marketing trials.

715 **4.4.2.2 Use Case #2: Post-Market Surveillance AE Reporting**

This use case demonstrates how the DSC Profile can be used to report an adverse event in the context of post-market surveillance.

4.4.2.2.1 Post-Market Surveillance AE Reporting Use Case Description

720 In the afternoon, when he was seeing the ambulatory clinic patients, Dr. Smith discussed with Mr. Brown the muscle weakness and shooting pains in his legs that started a few days after being put on his high dose statin regimen following his angioplasty. Dr. Smith thought it was likely related to the statin and after counseling Mr. Brown, Dr. Smith pulled up his record in the EHR used by his practice, discontinued the statin, and marked reason for discontinuation as “AE”.

725 This brought up a pre-populated form with Mr. Brown’s demographics, current labs, medical history, medications and a text box labeled “Adverse Event”. Dr. Smith typed in ‘myopathy’ and noted that the generic and trade name of the statin was pre-populated in the form. He added a note that he had ordered tests to help confirm the diagnosis and they were pending. He then pressed the “Submit AE” button on the form and it disappeared, and Dr. Smith finished ordering tests and writing his notes on Mr. Brown in the EMR.

730 Dr. Smith remembered how he never previously considered reporting an AE from one of his patients since it involved finding a reporting form, filling out the information himself and usually being late to see his next patient. And if he would ask a nurse or pharmacist to file a report he knew the report would rarely, if ever, be submitted. With this new process he could complete the report himself and not have to pass along the burden to someone else.

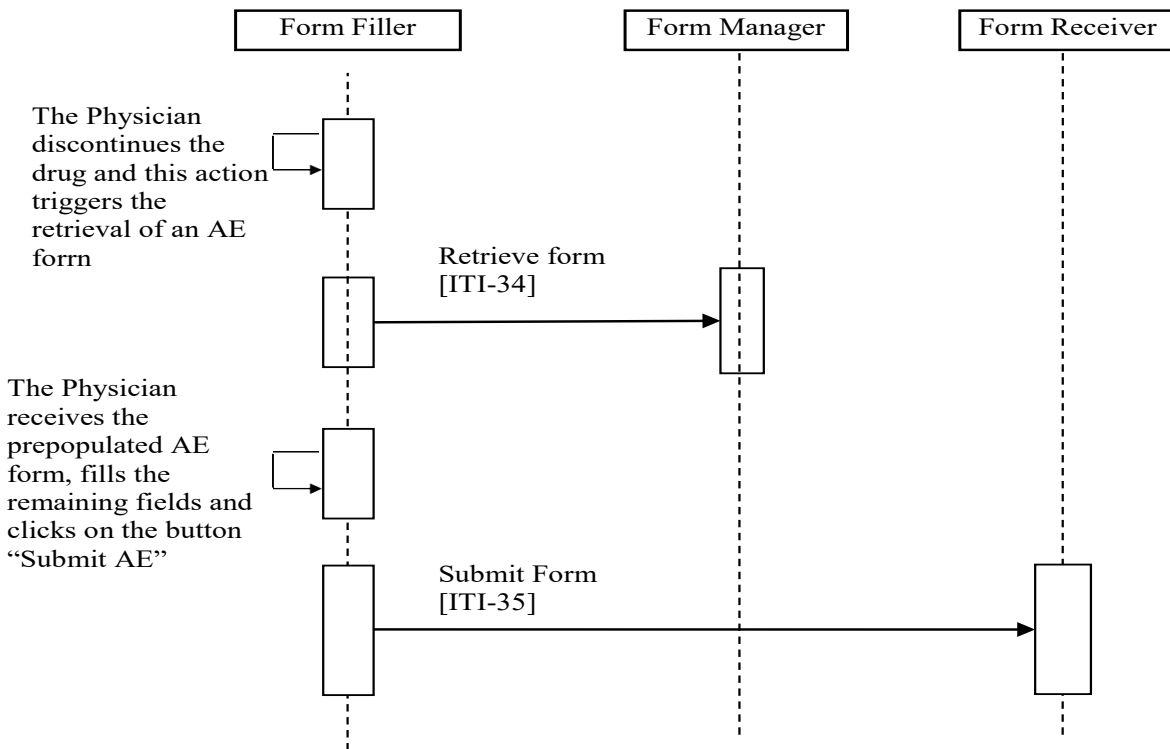
735 **4.4.2.2.2 Clinical Trial Adverse Event Process Flow**

Figure 4.4.2.2-1: Basic Process Flow in DSC Profile used in the context of a Post-Marketing Surveillance Adverse Event Reporting

4.4.2.2.3 Current State

740 Currently in the U.S., Europe, and Japan, adverse drug events (ADEs) and adverse drug reactions (ADRs), here generally referred to as adverse events (AEs), are collected on drugs (here meant to include both exogenous chemical and endogenous or ‘biologics’) through all phases of clinical trials and after the drug has been approved for marketing, through to the life of the drug on the market. There are some differences in regulations, practices and systems by geographic region, but certain commonalities remain:

750 Once a drug is on the market, AEs are collected through various means, but in general the common state of affairs is through a paper-based system of reporting. In some cases, reporting initiates from phone calls to a drug information center sponsored by a drug manufacturer from consumers taking the medication, doctors caring for patients or other healthcare personnel such as pharmacists. The information is transcribed by the call center personnel and forwarded on to the manufacturer. In other situations, the consumer or healthcare practitioner may call the FDA directly or may send in a paper form through the postal service or by fax, to report the event. In the U.S. a MedWatch® form can be used for this purpose. In all cases of post-marketed reporting, getting the data from the system in which it resides (e.g., EMR) into a form which is ready to be received by regulatory authorities is a laborious process and not part of any clinical routine. This

760 ‘burden of reporting’ likely has a significant role in the number of difficulties seen in post marketing reporting of AEs which include a lack of quality in reports, a small number of reports, and a general difficulty in getting enough information in any one report to make an adequate assessment of the event(s) in question. In some countries this situation is improved through national systems and/or regulatory requirements for reporting, but in all cases the act of reporting can be made easier through a more direct flow of clinical information on the AE to the regulatory authorities and manufacturers.

4.4.2.2.4 Desired State

765 Given the heterogeneous environment for AE collection and reporting, it is highly desirable to provide some more efficient way to move the data through the reporting system so that the act of reporting becomes easier as a routine output of usual clinical care processes, data fidelity can be maintained, reporting can be timely, and the number of translations of data that occur can be reduced to a minimum.

770 The desired state for post-marketing reporting is one in which the burden to submit an AE report is very low and is part of the routine of the reporter - especially in the case of the physician or other healthcare practitioner. This same reasoning holds true if the reporter is a consumer or patient using a system to maintain their personal health information such as a Personal Health Record. In such post-marketing AE reporting, integrated reporting solutions should trigger and
775 pre-populate essential information to the extent possible in standard formats. Such solutions should also enable behind the scene mapping of clinical care interface terminology through clinically interoperable formats directly to elements required for surveillance for medications and biologics in an integrated fashion.

4.5 DSC Security Considerations

4.5.1 Consistent Time (CT)

In order to address identified security risks all actors in DSC should be grouped with Consistent Time (CT) Profile – Time Client. This grouping will assure that all systems have a consistent time clock to assure a consistent timestamp for audit logging.

4.5.2 Audit Trail and Node Authentication (ATNA)

785 In order to address identified security risks all actors in DSC should be grouped with Audit Trail and Node Authentication (ATNA) Profile – Secure Node or ATNA Secure Application. This grouping will assure that only highly trusted systems can communicate and that all changes are recorded in the audit log.

4.5.3 Cross Enterprise User Authentication (XUA)

790 In order to address identified security risks all actors in DSC should be grouped with Cross Enterprise User Authentication (XUA) Profile actors as appropriate. This grouping will assure that only highly trusted persons can communicate.

4.6 DSC Cross Profile Considerations

Not applicable

795

5 Newborn Admission Notification (NANI) Profile

800 The NANI Profile describes the content needed to communicate a timely newborn admission,
and discharge event notifications to be used, for example, to inform public health Early Hearing
Detection and Intervention (EHDI) screening programs. The Newborn Admission Notification
Information (NANI) Profile optimizes and standardizes the sharing of patient admission and
discharge data for a newborn to a receiving system, thereby eliminating the time and cost of
manual data entry. Automating the delivery of these basic data will reduce the errors currently
805 producing a challenge to jurisdictional programs that provide, for example, newborn screening
services and evaluate quality of care delivered.

This supplement is written for Trial Implementation. It is written as an addition to the Quality,
Research and Public Health Technical Framework.

This supplement references the following documents which the reader should review as needed:

810 HL7 V2 Messaging for ADT Messages V2.3.1. This profile includes only the additional
constraints added to the ADT message to support the NANI use cases.

5.1 NANI Actors, Transactions and Content Modules

Figure 5.1-1 shows the actors directly involved in the NANI Profile and the relevant transaction
between them.

815 There are two actors in this profile, the Information Source and Information Recipient. Event
notification content is created by the Information Source based on jurisdictional requirements
and data processing requirements of the Information Recipient. Event notification content is
consumed and used by the Information Recipient.

820 The NANIFeed [QRPH-34] transaction is used by these actors to share the notification content.
This transaction is similar in many ways to the Patient Identity Management [ITI-30] transaction
with Pediatric Demographics Option. However, [QRPH-34] adds support for additional events
that may be relevant when tracking newborn care.

The [QRPH-34] message content is further constrained in Volume 4 for use in the US Realm
where race and ethnicity fields are required for reporting on process quality of public health
programs for newborns.

825

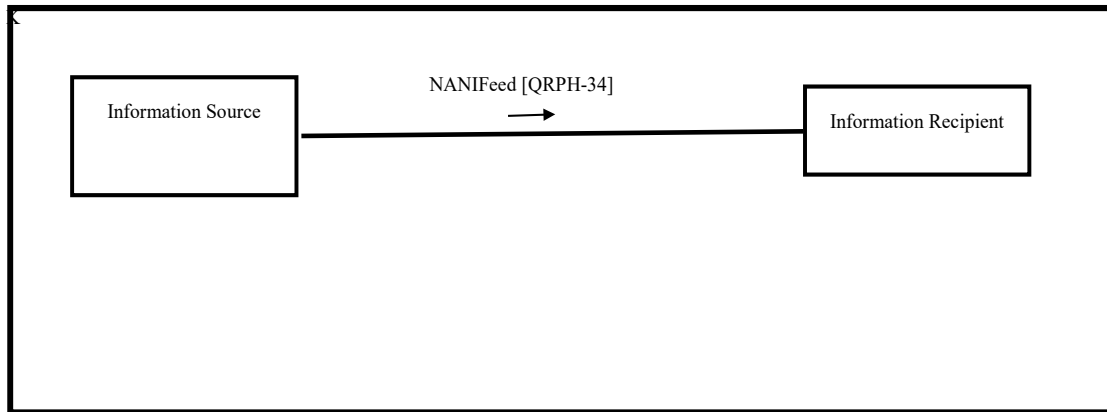


Figure 5.1-1: NANI Actor-Transaction Diagram

830 Table 5.1-1 lists the transactions for each actor directly involved in the NANI Profile. In order to claim support of this profile, an implementation must perform the required transactions (labeled “R”). Transactions labeled “O” are optional.

Table 5.1-1: NANI Profile - Actors and Transactions

Actors	Transactions	Optionality	Section in Vol. 2
Information Source	NANIFeed [QRPH-34]	R	QRPH TF-2: 3.34
Information Recipient	NANIFeed [QRPH-34]	R	QRPH TF-2: 3.34

5.1.1 Actor Descriptions and Actor Profile Requirements

835 Normative requirements are typically documented in Volume 2 (Transactions) and Volume 3 (Content Modules). Some Integration Profiles, however, contain requirements which link transactions, data, and/or behavior. Those Profile requirements are documented in this section as normative requirements (“shall”).

5.1.1.1 Information Source

840 An Information Source SHALL populate admission event notification and discharge event notification content and transmit it to the Information Recipient for all newborns using the NANIFeed [QRPH-34] transaction.

5.1.1.2 Information Recipient

The Information Recipient SHALL be able to receive admission and discharge event content from the Information Source.

845 Accept appropriate admission notifications based on record filtering, matching specifications. The Information Recipient MAY be able to:

Accept appropriate event notifications based on record filtering, matching specifications, and intended usage for newborn discharge, transfer, and update information.

5.2 NANI Actor Options

850 Options that may be selected for this profile are listed in the Table 5.2-1 along with the actors to which they apply. Dependencies between options when applicable are specified in notes.

Table 5.2-1: NANI - Actors and Options

Actor	Options	Volume & Section
Information Source	<i>No options defined</i>	--
Information Recipient	<i>No options defined</i>	--

5.3 NANI Actor Required Groupings

855 Actor(s) which are required to be grouped with another actor(s) are listed in this section. The grouped actor may be from this profile or a different domain/profile. These mandatory required groupings, plus further descriptions if necessary, are given in the table below.

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).

860 Section 5.5 describes some optional groupings that may be of interest for security considerations and Section 5.6 describes some optional groupings in other related profiles.

Table 5.3-1: Required Actor Grouping

NANI Actor	Actor to be grouped with	Technical Framework Reference
Information Source	Consistent Time / Time Client	ITI TF-1: 7
Information Recipient	Consistent Time / Time Client	ITI TF-1: 7

5.4 NANI Overview

865 The Newborn Admission Notification Information (NANI) Profile optimizes and standardizes the sharing of patient admission, discharge, transfer and update data for a newborn to a receiving system, thereby eliminating the time and cost of manual data entry. Automating the delivery of these basic data reduces the errors currently producing a challenge to jurisdictional programs that provide, for example, newborn screening services and evaluate quality of care delivered.

870 Hearing loss identified with newborn hearing screening is considered a neuro-developmental emergency. Thus, hearing screening has received widespread acceptance by public health in the United States (US), England, Scotland and Australia. Projects are also underway worldwide,

including Mexico, India and South America to implement systems that make sharing newborn hearing screening information more efficient and more effective.

875 Currently, for example, public health Early Hearing Detection and Intervention (EHDI)
programs for newborn hearing screening do not have a consistent and reliable method to obtain a
timely notification of a newborn’s birth at a hospital or birthing facility. This lack of birth
notification information complicates the task of assuring that all eligible newborns are screened
at birth for hearing loss prior to hospital discharge. Regardless of how a hospital submits
880 newborn hearing screening results to a jurisdictional hearing-screening program, critical
information is often incomplete, inaccurate, late, or missing entirely. This has the potential to
impact the delivery of care for an individual child and may lead to increased “lost to follow-up”.
In this context, “lost to follow-up” means the infant does not receive the next steps in care:
screening, diagnostic testing, or intervention then the infant is “lost to follow-up”. For example,
885 it impacts an EHDI program’s quality and jeopardizes the program’s goal of providing all
children screening by one month, diagnosis by 3 months, and intervention before 6 months. In
the US, these goals are collectively known as the CDC 1, 3, 6 National Early Hearing Detection
and Intervention (EHDI) Goals.

It is anticipated that the NANI Profile could be used by other child health programs.

890 **5.4.1 Concepts**

Care guidelines for newborns may include requirements on the encounter associated with the
newborn’s birth event. Data communicated in an admission event notification to signal the
admission is associated with a birth event may vary by jurisdiction. Agreements between
Information Source and Information Recipient Actors may be needed to clarify how a birth event
895 will be conveyed.

When a child is born outside of a care facility, then transported to a care facility and admitter for
care subsequent to the birth event, the encounter is not considered the “birth encounter” and the
admission event notification is not encoded using the pattern to indicate a birth event.

900 The term “transfer” may be used in spoken language to describe situations where a patient is
moved from one care facility to another. Within the context of the NANI Profile the term
“transfer” is restricted to mean the patient is discharged from the current facility and admitted to
a new care facility. This use of the term “transfer” should not be confused with the more specific
usage of the term “transfer” used by HL7 ADT A02 message definitions.

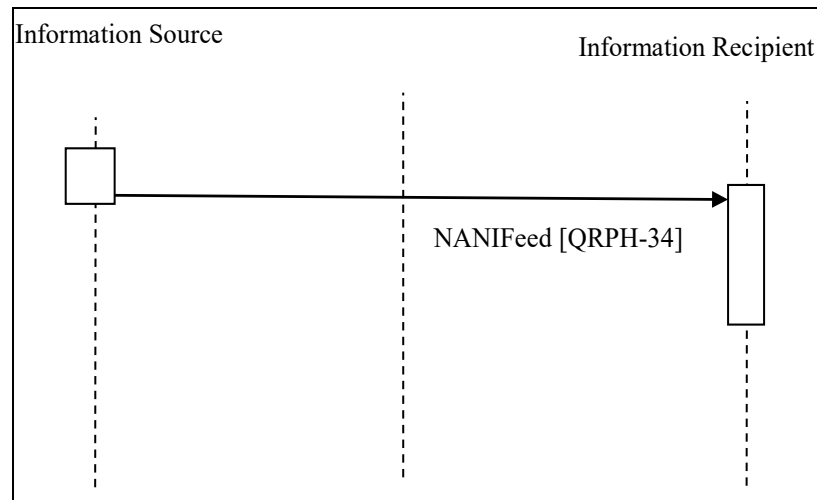
5.4.2 Use Cases

905 **5.4.2.1 Use Case #1: Birth Admission to a Hospital**

5.4.2.1.1 Birth Admission to a Hospital Use Case Description

A child is born in the hospital. A newborn admission is done in the EHR to record the baby as a
new patient as of the date and time of the baby’s birth.

5.4.2.1.2 Birth Admission to a Hospital Process Flow



910

Figure 5.4.2.1.2-1: Process Flow for a Newborn Admission that is a Birth Encounter

5.4.2.1.3 Current State

A child is born in the hospital. The baby is admitted into the EHR as a new patient.

915 After the mother and child have been discharged, a birth clerk enters basic demographic information into a public health portal.

5.4.2.1.4 Desired State

Pre-conditions:

920 Encoding requirements for representing a birth encounter has been established between the Information Source and Information Recipient systems.

Main Flow:

The message content is populated with the admission event content appropriate for a birth encounter. An admission event is communicated by the Information Source to the Information Recipient.

- 925
1. Baby Joe Smith is born at a hospital and his demographic information is entered into the hospital's EHR system as a birth admission.
 2. The hospital's EHR, acting as the Information Source, notifies Public Health, acting as the Information Recipient, about Baby Joe Smith's birth at the facility. Information about Baby Joe Smith's demographic details and his admission to the hospital's nursery are communicated in an admission notification. The information includes data to identify the encounter as a birth encounter.
- 930

- 935 3. The Information Recipient applies the appropriate filter and matching criteria for the admission and discharge events. The Information Recipient accepts and consumes admission and discharge event content, and rejects events not associated with birth. In some cases, the Information Source applies an appropriate filter so only birth admission and discharge events are sent to the Information Recipient.

Post-conditions:

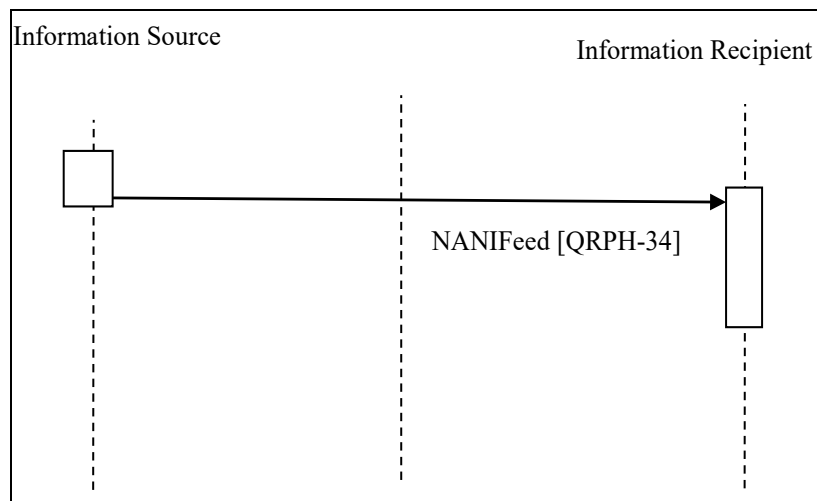
Information processing triggered by the notification event proceeds at the Information Recipient.

5.4.2.2 Use Case #2: Birth Prior to Hospital Admission

940 **5.4.2.2.1 Birth Prior to Hospital Admission Use Case Description**

A woman goes into labor at her house. Her partner is at work and she home alone. She fears she will not be able to drive herself to the hospital. She calls 911 and an ambulance as dispatched. The baby is born at home before the EMTs arrive.

5.4.2.2.2 Birth Prior to Hospital Admission Process Flow



945 **Figure 5.4.2.2.2-1: Process Flow for a Newborn Admission that is not a Birth Encounter**

5.4.2.2.3 Current State

A child is born at home. The mother and child are brought to the hospital and admitted.

950 After the mother and child have been discharged, a birth clerk enters basic demographic information for the patients into a public health portal.

5.4.2.2.4 Desired State

Pre-conditions:

Requirements for defining and representing a birth encounter has been established between the Information Source and Information Recipient systems.

955 **Main Flow:**

The Information Source populates the event notification content. The admission event content does not indicate this is a birth encounter. The Information Source communicates the admission event notification to the Information Recipient.

- 960
1. Baby Jeremiah Johnson is born at home. The newborn is transported to the hospital where he is admitted and his demographic information is entered into the hospital EHR system as an admission.
 2. The hospital's EHR, acting as the Information Source, notifies Public Health, acting as the Information Recipient about Baby Jeremiah Johnson's admission, his demographic details and his admission to the hospital nursery. In this example, the admission does not include data which would indicate this is a birth encounter because the baby was born prior to the start of the encounter.
 - 965 3. The Information Recipient applies the appropriate filter and matching criteria for the admission event to accept and consume the event content, or reject it.

Post-conditions:

970 Information processing triggered by the notification event proceeds at the Information Recipient.

5.4.2.3 Use Case #3: Baby Named After Transfer

5.4.2.3.1 Baby Named After Transfer Use Case Description

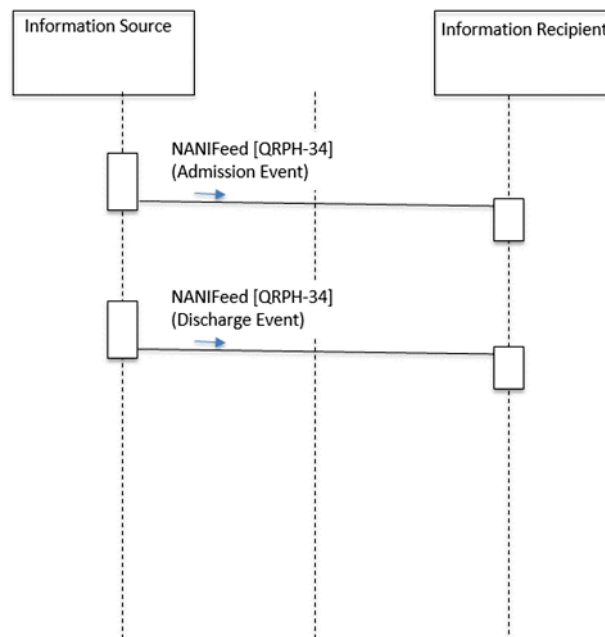
975 The Information Source populates then communicates the birth admission event to the Information Recipient. The Information Recipient accepts the admission event content and initiates the triggered workflow.

Communication regarding the baby's departmental movement event from the Labor and Delivery department to the NICU is out of scope for this profile.

Communication regarding the patient update event when the baby is named is out of scope for this profile.

980 The Information Source populates then communicates the discharge event to the Information Recipient for James Michael Jones. The Information Recipient accepts the discharge event content and initiates the triggered workflow.

5.4.2.3.2 Baby Named After Transfer Process Flow



985

Figure 5.4.2.3.2-1: Process Flow for a Baby Named After Transfer

5.4.2.3.3 Current State

A child is born in the hospital. The child is then discharged from that facility to another facility for specialized treatment.

990 After the mother and child have been discharged, a birth clerk enters basic demographic information for the patients into a public health portal.

5.4.2.3.4 Desired State

Pre-conditions:

Encoding requirements for representing event notification of birth encounter has been established between the Information Source and Information Recipient systems.

995

Main Flow:

An admission event is communicated by the Information Source to the Information Recipient. The message content is populated. The admission event content indicates this is a birth encounter.

1000

A discharge event is communicated from the Information Source to the Information Recipient. The discharge event carries updated patient name information that was not available at the time of admission (birth).

1. Baby is born in a hospital but the parents do not name him right away. His demographic information is entered into the hospital EHR system as an admission but his name is recorded and Baby Johnson.
- 1005 2. The hospital's EHR, acting as the Information Source, notifies Public Health, acting as the Information Recipient about Baby Johnson's admission, his demographic details and his admission to the hospital nursery. The admission uses the temporary name.
3. The Information Recipient applies the appropriate filter and matching criteria for the admission event to accept and consume the event content, or reject it.
- 1010 4. At some point in the encounter, the parents inform the hospital that the baby's name will be Jeremiah.
5. When the baby is discharged, the EHR creates and sends a discharge message. The message includes the updated name for baby Jeremiah Johnson.

Post-conditions:

- 1015 Information processing triggered by the notification events proceeds at the Information Recipient.

5.5 NANI Security Considerations

5.5.1 Audit Trail and Node Authentication (ATNA)

- 1020 In order to address identified security risks all actors in NANI should be grouped with the Secure Node or Secure Application in the Audit Trail and Node Authentication (ATNA) Profile. This grouping will assure that only highly trusted systems can communicate and that all changes are recorded in the audit log.

5.6 NANI Cross Profile Considerations

5.6.1 Consistent Time (CT)

- 1025 In order to address identified security risks all actors in NANI shall be grouped with the Time Client in the ITI Consistent Time (CT) Profile (see Section 5.3). Admission and discharge event reporting must be documented to include date and time to the level of precision required to support longitudinal processing of the information.

5.6.2 Sharing Value Sets (SVS)

- 1030 Actors in the NANI Profile MAY support the ITI Sharing Value Set (SVS) Integration Profile in order to use a common uniform managed vocabulary for dynamic management of value set bindings, for example to do a look-up on HL7 Table 0007 (value set) to determine the allowable Admission types to populate in the IS field.

1035

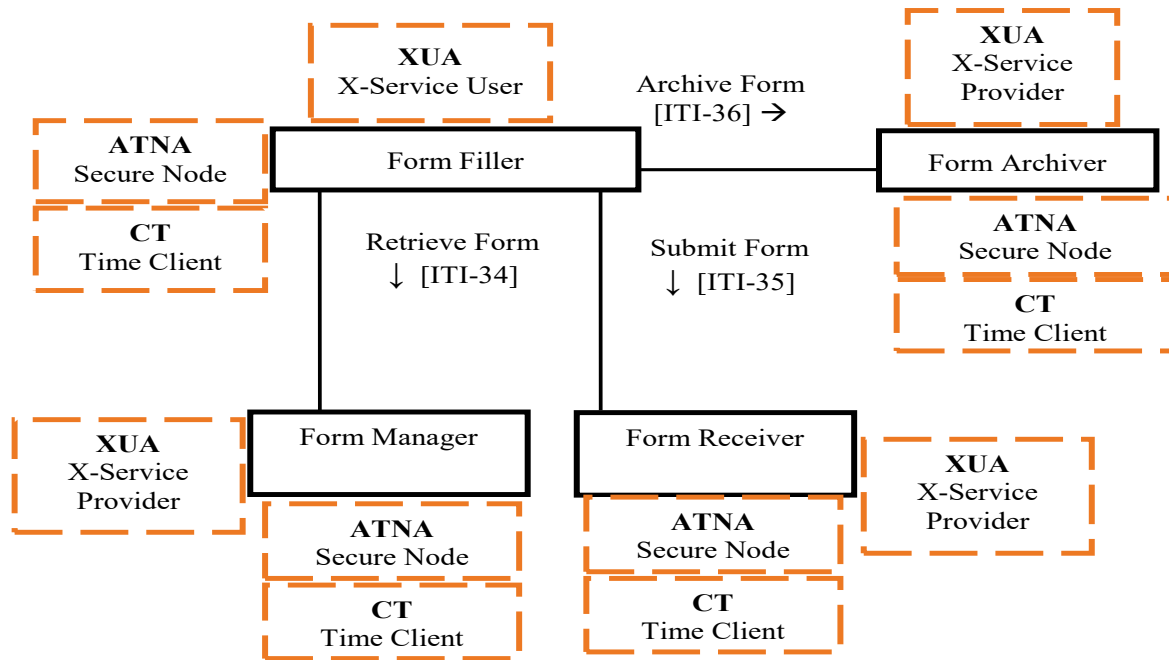
Appendices

Appendix A – Further Details on Implementations of the DSC Profile

This appendix is informative.

1040 A.1 Grouped Actors in the DSC Profile

Figure A.1-1 below shows actors involved in the DSC Integration Profile. Actors shown in full black outline are part of the definition of the DSC Profile. Actors shown in dashed orange lines may be grouped with other DSC actors and provide security functions.



1045

Figure A.1-1: Grouped Actors in the DSC Profile

Appendix B – Deployment Models of the NANI Profile

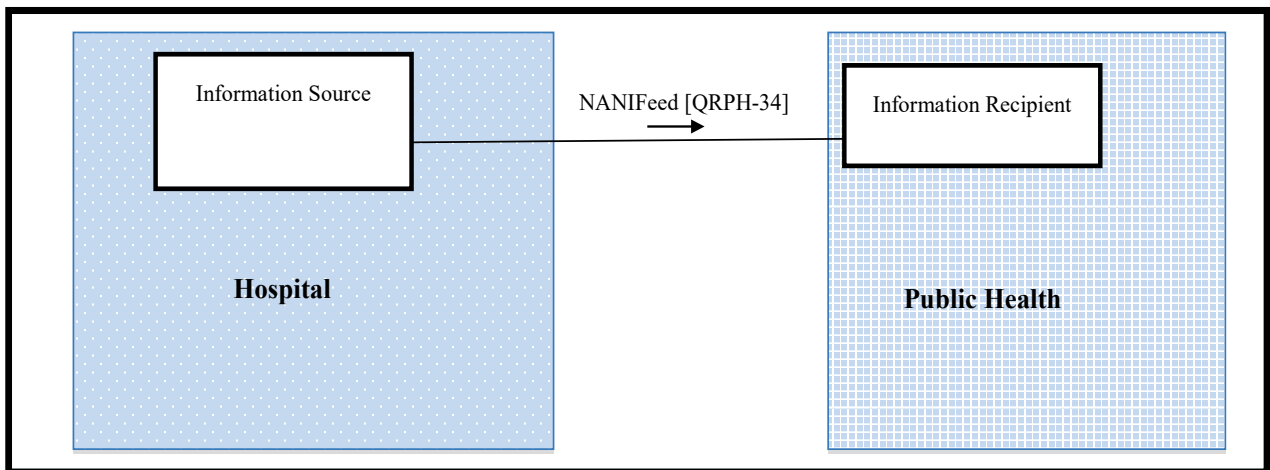
This appendix is informative.

1050 B.1 Deployment Models

The Newborn Admission Notification Information Profile could be implemented by different systems. Depending on the jurisdiction requirements and the number of systems involved in the implementation, different profile actor roles can be played by different systems. This section describes some of the possible implementation options.

1055 B.1.1 Deployment Model #1: Direct Public Health Submission

In this scenario, the birthing hospital plays the role of the Information Source. The State EHDI Program plays the role of the Information Recipient. See Figure B.1.1-1.



1060 **Figure B.1.1-1: Deployment Model #1: Direct Public Health Submission**

B.1.2 Deployment Model #2: HIE Submission

This scenario assumes that the jurisdiction has a functioning Health Information Exchange which plays the Information Recipient and Information Source roles. The birthing hospital plays the Information Source role. The Information Recipient role is played by the State EHDI Program. See Figure B.1.2-1.

1065

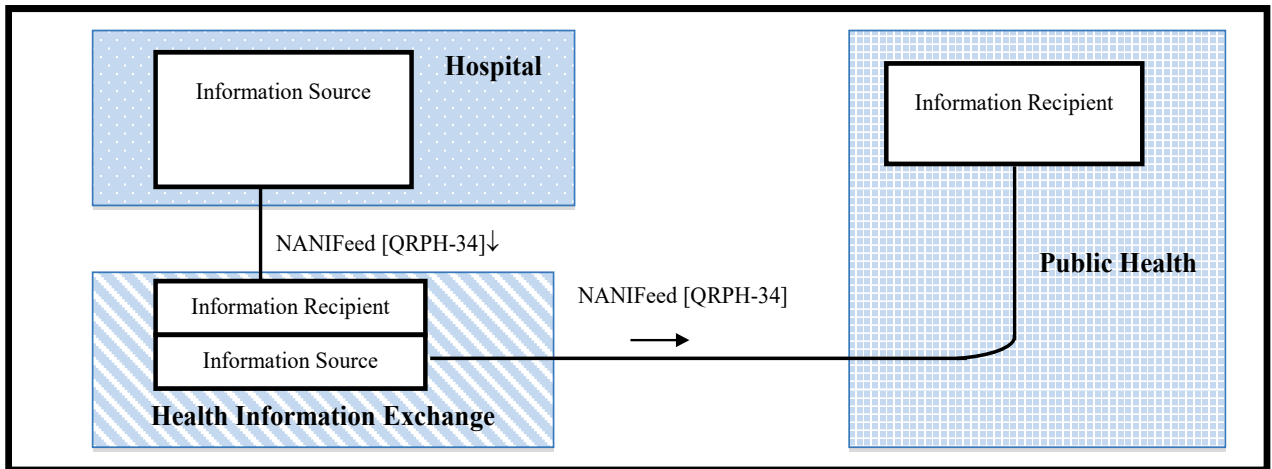


Figure B.1.2-1: Deployment Model #2: HIE Submission

1070 **B.1.3 Deployment Model #3: Public Health EHDl Program**

In this scenario, the State EHDl program plays two roles – Information Recipient and Information Source. The hospital EHR plays the role of Information Source. See Figure B.1.3-1.

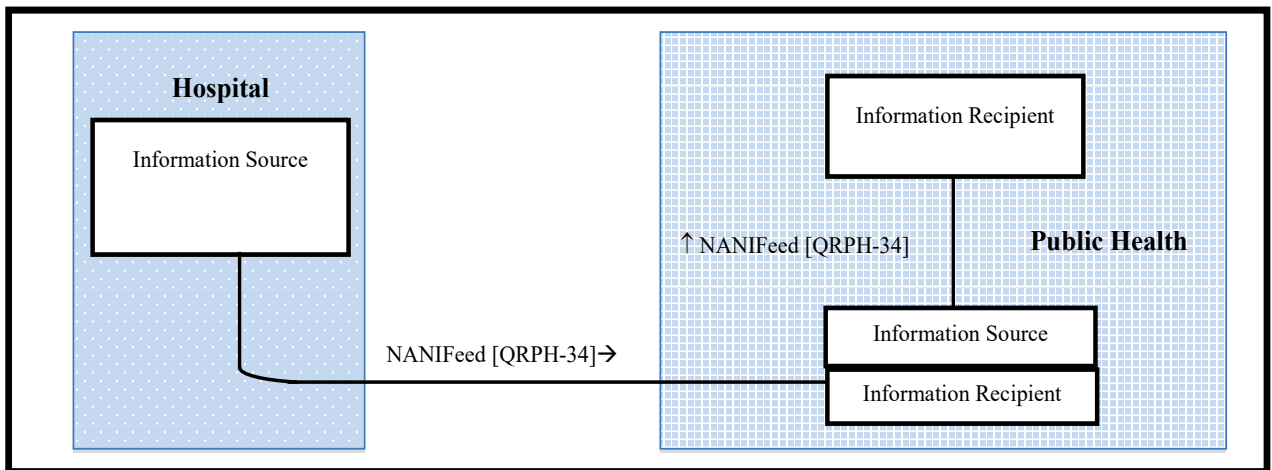


Figure B.1.3-1: Deployment Model #3: Public Health EHDl Program

1075

Glossary

1080 The IHE Glossary, an appendix to the *IHE Technical Frameworks General Introduction*, can be found [here](#).