

Integrating the Healthcare Enterprise



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IHE PCC

Technical Framework Supplement

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**Query for Existing Data for Mobile
(QEDm)**

HL7® FHIR® STU 3

Using Resources at FMM Levels 2-5

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Rev. 1.1 – Trial Implementation

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Please verify you have the most recent version of this document. See [here](#) for Trial Implementation and Final Text versions and [here](#) for Public Comment versions.

Foreword

30 This is a supplement to the IHE Patient Care Coordination Technical Framework V11.0. 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 September 8, 2017 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 Patient Care Coordination Technical Framework. Comments are invited and can be submitted at
35 http://www.ihe.net/PCC_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.

<i>Amend Section X.X by the following:</i>
--

40 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.

45 General information about IHE can be found at <http://ihe.net>.

Information about the IHE Patient Care Coordination 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>.

50 The current version of the IHE Patient Care Coordination Technical Framework can be found at http://ihe.net/Technical_Frameworks.

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Introduction to this Supplement

140

Whenever possible, IHE profiles are based on established and stable underlying standards. However, if an IHE committee determines that an emerging standard offers significant benefits for the use cases it is attempting to address and has a high likelihood of industry adoption, it may develop IHE profiles and related specifications based on such a standard.

The IHE committee will take care to update and republish the IHE profile in question as the underlying standard evolves. Updates to the profile or its underlying standards may necessitate changes to product implementations and site deployments in order for them to remain interoperable and conformant with the profile in question.

This QEDm Profile uses the emerging HL7^{®1} FHIR^{®2} specification. The FHIR release profiled in this supplement is STU 3. HL7 describes the STU (Standard for Trial Use) standardization state at <https://www.hl7.org/fhir/versions.html>.

In addition, HL7 provides a rating of the maturity of FHIR content based on the FHIR Maturity Model (FMM): level 0 (draft) through 5 (normative ballot ready). The FHIR Maturity Model is described at <http://hl7.org/fhir/versions.html#maturity>.

Key FHIR STU 3 content, such as Resources or ValueSets, used in this profile, and their FMM levels are:

FHIR Resource Name	FMM Level
AllergyIntolerance	3
Bundle	5
Condition	3
DiagnosticReport	3
DocumentReference	3
Encounter	2
Immunization	3
Medication	3
MedicationRequest	3
MedicationStatement	3
Observation	5
OperationOutcome	5
Patient	5
Procedure	3
Provenance	3

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

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

145 The Query for Existing Data for Mobile Profile (QEDm) supports dynamic queries for clinical data elements, including observations, allergy and intolerances, problems, diagnostic results, medications, immunizations, procedures, encounters and provenance by making the information widely available to other systems within and across enterprises to support provision of better clinical care. It defines a transaction used to query a list of specific data elements, persisted as FHIR resources.

150 QEDm is functionally equivalent to the QED Profile (based on HL7v3), but QEDm is better suited for implementation by application on mobile devices. The term “mobile” must be understood in a wide sense: it refers not only to applications on devices used for mobility that are resource- and platform-constrained. (e.g., tablets, smartphones, and embedded devices including home-health devices), but also to larger systems deployed in environments where interoperability requirements are simple, such as pulling the latest summary for display.

155 The Query for Existing Data for Mobile (QEDm) Profile defines a standardized interface to health (HTTP-based RESTful APIs) suited for deployment of mobile applications on resource-constrained devices with simple programming environment (e.g., JavaScript), simple protocol stack (e.g., HTTP), and simple display functionality (e.g., HTML browser). The goal is to limit required additional libraries that are often necessary to process SOAP, MIME-Multipart, MTOM/XOP Web Services.

160 The Query for Existing Data for Mobile Profile (QEDm) Profile, uses the already defined actors Clinical Data Consumer and Clinical Data Source, for which it specifies option and a transaction to be used for querying a list of specific data elements, persisted as FHIR resources. The current version of Supplement doesn’t consider the reconciliation of the fine-grained data elements gathered by the Clinical Data Source and/or Clinical Data Consumer Actors. In order to perform
165 reconciliation a grouping with RECON Reconciliation Agent should be considered, but the current version of RECON Profile Supplement needs be updated to make this actor properly work together with QEDm.

170 The QEDm Profile may also be deployed in conjunction with document sharing profiles such as MHD or XDS Profiles. The Document Provenance Option in QEDm is used in particular by the mXDE Profile to address the combined deployment of QEDm for access to fine-grained data element with links to source documents accessible through the MHD or XDS Profiles.

Open Issues and Questions

175 None

Closed Issues

QEDm_011: For the Medications Option, should we add split in two distinct options and add a specific query to the Medication Resource?

- 180
- In the current specification, the medication option includes both queries for the medication request and the medication statement. It was discussed if those should each be a distinct option.

Resolution:

⇒ **In the trial implementation version of this profile, it was decided to keep those as a single option and consider implementers feedback if they need to be split.**

- 185
- Current specification allows to retrieve the Medication Resource related to each MedicationRequest or MedicationStatement by performing a query by ‘patient’ for those resources and by supporting the “_include” of the related Medication into the returned Bundle. It was discussed the need to include a specific query for the Medication Resource, along with query parameters for searching on Medication such as: code, ingredient,

190 container, form...

Resolution:

⇒ **It was decided in the Trial implementation version to not include a specific query for the Medication Resource and consider implementer’s feedback if such a query was needed.**

195

QEDm_001: Agree on the list of requirements for QEDm by comparing with QED

Resolution:

	Requirements	QED	QEDm
1	Support <u>listing</u> of Problems, Medications, Allergies, Med-Allergies	Yes	Yes By using the FHIR Condition Resource
2	Supports <u>listing</u> of rest of DE (Data-element) per full QED List	Yes	Yes
3	Supports <u>listing</u> of additional DE per DAF (Access Framework) resources	No	Yes, almost
4	Supports <u>access</u> to DE across DAF/US Core defined resources	No	To be decided

	Requirements	QED	QEDm
5	Identifies source documents from where DE was extracted, if any.	Yes (but not clearly)	Yes
6	Selects source documents for scope of query	No	Yes
7	Flag in response that auto de-duplication has happen by clinical DE source	No	No (closed Issue)
8	Shows specific DEs that have been auto de-duplicated	No? (not with RECON)	No, too complex

200 ***QEDm_002: Scope Listing of Data Elements***

Which is the best approach in specifying the QEDm query transaction and complementary provenance information?

FHIR allows essentially two approaches (querying strategies in FHIR STU3):

⇒ *Querying ‘named’ Lists of resources (‘Operations’)*

205 ⇒ *Querying directly the underlying resources*

Considerations:

⇒ *Only the support for listing Resources has sense from a clinical point of view (see Issue QEDm:001 - requirements 1,2,3)*

210 ⇒ *FHIR List resource enumerates a flat collection of resources and provides features for managing the collection. While a particular List instance may represent a "snapshot", from a business process perspective the notion of "List" is dynamic – items are added and removed over time. The list resource references other resources. Lists may be curated and have specific business meaning (see [here](#) for more comments).*

Resolution:

215 ⇒ ***Basic remains the goal and Argonauts doesn’t consider ‘curated lists’ (aka ‘named’ Lists of resources) as a basic function → start consider querying directly the underlying resources***

220 ***QEDm_003: which are the QEDm query parameters to consider for accessing Data Elements (Resources)?***

Resolution:

⇒ ***try to replicate QED functionalities according to the query strategy adopted.***

225 ***QEDm_004: To define the core set of FHIR resources that align with QED and related QEDm’s options***

Resolution strategy:

- ⇒ *consider a subset of FHIR Resources: the stable ones. (keep in the Supplement the complete table to make evident all open issues about Resources until the final review: see “Classification of Information” section for more details)*
- ⇒ *consider the STU3 version of Resources.*

230

Comments:

Here below a comparison table between the current clinical information classification/options from QED, QEDm and FHIR Resources.

235

Alternative classifications from Argonauts and US Core projects/initiatives have been considered and discussed.

QED Option	QEDm Option	FHIR Resource/Profile
Vital Signs	Simple Observations	Observation (Vital Sign are profiled Observations)
Diagnostic Results	Diagnostic Results Option	DiagnosticReport
Problems and Allergies	Allergy and Intolerances	AllergyIntolerance
	Conditions	Condition
Medications	Medications	Medication MedicationStatement MedicationRequest
Immunizations	Immunizations	Immunization
Professional Services	Procedures	Procedures
	Encounters	Encounter
	Provenance	Provenance
		Goals → not considered
		Assessment and Plan → not considered
		CareTeam → not considered
		Practitioner → not considered
		Organization → not considered
		Location → not considered

Resolution:

240

- ⇒ ***Only a core-set of FHIR resources will be considered, consequently only a limited number of options are going to be specified. See the table above***

QEDm_005: Managing reconciliation of Data Elements

245 *How to record reconciliation performed on the FHIR resources returned by the QEDm query transaction?*

Considerations:

*Reconciliation of clinical data without a manual intervention has no sense.
An automatic algorithm could work well if limited to the data deduplication.*

Consequences:

250 • *a ‘manual reconciliation’ can be conceived at the Clinical Data Consumer side and it’s necessary when this actor is going to perform multiple query for gathering and merging information from different sources → the reconciliation is obtained by considering a Reconciliation Agent grouped with it.*

• *an ‘automatic deduplication’ can be conceived as option for the Clinical Data Source*

255 *Reconciliation/deduplication specific content is already defined by RECON. The results of reconciliation are noted in the FHIR List resource by using the FHIR Provenance resource. See the following two sections:*

• *PCC Vol.3: 6.6.A - FHIR Reconciled List*

• *PCC Vol.3: 6.6.B - FHIR Provenance Constraints*

260 *BUT:*

⇒ *RECON specifications must be updated to FHIR STU3*

⇒ *See also considerations about multi-stage import/reconciliation supported by the Provenance Resource: <http://hl7.org/fhir/2017Jan/provenance.html#6.2.4.6>*

Resolution:

265 ⇒ ***too complex, no reconciliation and no deduplication will be considered by QEDm (no automatic operations specified by RECON Profile)***

QEDm_006: new name for the [PCC-44] transaction: “Mobile Query Existing Data”?

270 *In order to appear more generic it’s proposed to use the name “Mobile Query Existing Data” for the transaction [PCC-44] to be aligned with the QED [PCC-2] “Query Existing Data” transaction, just like done with PIX/PIXm and PDQ/PDQm*

Resolution:

⇒ ***ok to rename.***

275 ***QEDm_007: How to consider the “Multi-Patient Query Option” in the query transaction?***

Resolution:

⇒ *ok to remove this option from this year scope*

QEDm_008: Consistency – How to identify Document Sources of Data Elements

280 Strategy:

Consider the FHIR Provenance resource as used in PCC-RECON: “When the Data Element comes from a Document, the ID of the document is used as the source. When the Data Element is the result of a query (such as QED), the query ID is the source.

285 When the data comes directly from a system, provenance may not exist because there is not a document source ID from the system. The solution is to start broad and add the “provenance” Option (source of the data). ...”

Resolution:

⇒ *The original Document(s) reference(s) can be supported by the Provenance.entity:*
<http://hl7.org/fhir/STU3/provenance.html>

290 (in general each Provenance object can link N ‘target’ Resources to M ‘entity’ Documents)

⇒ *To consider also the available FHIR specifications on FHIR & XDS Documents*
<https://www.hl7.org/FHIR/STU3/usecases.html#xds>

295 • *specifically the DocumentReference FHIR resource:*
<https://www.hl7.org/FHIR/STU3/documentreference.html>

⇒ *Additional considerations on query for including Provenance:*

300 • *FHIR query on “resource” (e.g., medication), add “_revinclude” with “Provenance”. GET*
[base]/MedicationRequest?_revinclude=Provenance:target&criteria...Always on the GET by client and server must support.

• *For list FHIR is an “operation” (not RESTful GET). Is it worth exposing “list operations” because may be perfectly reconciled.*

• *Use Doc Resource versus and/or provenance resource*

305 **QEDm_009: QED retirement**

Resolution:

⇒ *it may be considered, but the timing is independent of QEDm completion.*

QEDm_010: Which is the best FHIR Implementation Guide to refer?

- 310
- Should we move to US-Core? Are there other countries/international efforts?
 - Alternative is Argonaut (modified, by removing a few US specific).

Considerations:

⇒ STU 3 ‘final’ has been released and the US Core IG has been aligned to STU3

Resolution:

- 315
- ⇒ ***No need to base the whole profile on US Core specific constraints. US Core resource specific profiling or other profiling can be referenced only if/when necessary***

General Introduction

320 *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:

Not applicable

325 Appendix B – Transaction Summary Definitions

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

Mobile Query Existing Data [PCC-44] – this transaction uses RESTful API to query clinical data elements and retrieve them as sets of FHIR resources.

330

Glossary

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

No new terms added.

335

Volume 1 – Profiles

Copyright Licenses

Add the following to the IHE Technical Frameworks General Introduction Copyright section:

No new copyright licenses added.

340

Add new Section X

X Query for Existing Data for Mobile (QEDm) Profile

345

The Query for Existing Data for Mobile Profile (QEDm) supports queries for clinical data elements, including observations, allergy and intolerances, conditions, diagnostic results, medications, immunizations, procedures, encounters and provenance by making the information widely available to other systems within and across enterprises. It defines a transaction used to query a list of specific data elements, persisted as FHIR resources.

350

QEDm is functionally equivalent to the QED Profile, but it is better suited for implementation by application on mobile devices. The term “mobile” must be understood in a wide sense: it refers not only to applications on devices used for mobility that are resource- and platform-constrained. (e.g.: tablets, smartphones, and embedded devices including home-health devices), but also to larger systems deployed in environments where interoperability requirements are simple, such as pulling the latest summary for display.

355

The Query for Existing Data for Mobile (QEDm) Profile defines a standardized interface to health (HTTP-based RESTful APIs) suited for deployment of mobile applications on resource-constrained devices with simple programming environment (e.g., JavaScript), simple protocol stack (e.g., HTTP), and simple display functionality (e.g., HTML browser). The goal is to limit required additional libraries that are often necessary to process SOAP, MIME-Multipart, MTOM/XOP Web Services.

360

The QEDm Profile may also be deployed in conjunction with document sharing profiles such as MHD or XDS Profiles. The Document Provenance Option in QEDm is used in particular by the mXDE Profile to address the combined deployment of QEDm for access to fine-grained data element with links to source documents accessible through the MHD or XDS Profiles.

X.1 QEDm Actors, Transactions and Content Modules

365

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 X.1-1 shows the actors directly involved in the QEDm Profile and the relevant transaction between them.

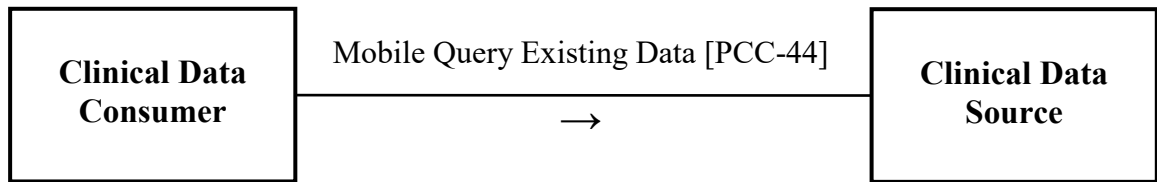


Figure X.1-1: QEDm Actor Diagram

370 Table X.1-1 lists the transactions for each actor directly involved in the QEDm 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 X.1-1: QEDm Integration Profile - Actors and Transactions

Actors	Transactions	Optionality	Reference
Clinical Data Source	Mobile Query Existing Data [PCC-44]	R	PCC TF-2: 3.44
Clinical Data Consumer	Mobile Query Existing Data [PCC-44]	R	PCC TF-2: 3.44

375 **X.1.1 Actor Descriptions and Actor Profile Requirements**

X.1.1.1 Clinical Data Source

The Clinical Data Source in this profile responds to FHIR-based queries for one or more fine-grained data elements (FHIR resources) defined by the options listed in Section X.2.

X.1.1.2 Clinical Data Consumer

380 The Clinical Data Consumer in this profile sends FHIR-based queries to the Clinical Data Source for one or more fine-grained data elements (FHIR resources) defined by the options listed in Section X.2. Rendering or further processing of the data is not defined by this profile.

X.2 QEDm Actor Options

385 Options that may be selected for each actor in this profile, if any, are listed in the Table X.2-1. Dependencies between options when applicable are specified in notes.

Table X.2-1: QEDm - Actors and Options

Actor	Option Name	Reference
Clinical Data Consumer	Simple Observations Option ⁽¹⁾	PCC TF-X.2.1.1
	Allergies and Intolerances Option ⁽¹⁾	PCC TF-X.2.1.2

Actor	Option Name	Reference
	Conditions Option ⁽¹⁾	PCC TF-X.2.1.3
	Diagnostic Results Option ⁽¹⁾	PCC TF-X.2.1.4
	Medications Option ⁽¹⁾	PCC TF-X.2.1.5
	Immunizations Option ⁽¹⁾	PCC TF-X.2.1.6
	Procedures Option ⁽¹⁾	PCC TF-X.2.1.7
	Encounters Option ⁽¹⁾	PCC TF-X.2.1.8
	Document Provenance Option	PCC TF-X.2.1.9
Clinical Data Source	Simple Observations Option ⁽¹⁾	PCC TF-X.2.2.1
	Allergies and Intolerances Option ⁽¹⁾	PCC TF-X.2.2.2
	Conditions Option ⁽¹⁾	PCC TF-X.2.2.3
	Diagnostic Results Option ⁽¹⁾	PCC TF-X.2.2.4
	Medications Option ⁽¹⁾	PCC TF-X.2.2.5
	Immunizations Option ⁽¹⁾	PCC TF-X.2.2.6
	Procedures Option ⁽¹⁾	PCC TF-X.2.2.7
	Encounters Option ⁽¹⁾	PCC TF-X.2.2.8
Document Provenance Option	PCC TF-X.2.2.9	

Note 1: At least one of these options shall be supported by the related actor

X.2.1 Clinical Data Consumer Options

X.2.1.1 Simple Observations Option

390 A Clinical Data Consumer that implements the Simple Observations Option performs the Mobile Query Existing Data transaction using the vocabulary specified for Simple Observations in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.1.

X.2.1.2 Allergies and Intolerances Option

395 A Clinical Data Consumer that implements the Allergies and Intolerances Option performs the Mobile Query Existing Data transaction using the vocabulary specified for Allergies and Intolerances in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.2.

X.2.1.3 Conditions Option

400 A Clinical Data Consumer that implements the Conditions Option performs the Mobile Query Existing Data transaction using the vocabulary specified for Conditions in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.3.

X.2.1.4 Diagnostic Results Option

A Clinical Data Consumer that implements the Diagnostic Results Option performs the Mobile Query Existing Data transaction using the vocabulary specified for Diagnostic Results in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.4.

405 **X.2.1.5 Medications Option**

A Clinical Data Consumer that implements the Medications Option performs the Mobile Query Existing Data transaction using the vocabulary specified for Medications in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.5.

X.2.1.6 Immunizations Option

410 A Clinical Data Consumer that implements the Immunizations Option performs the Mobile Query Existing Data transaction using the vocabulary specified for Immunizations in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.6.

X.2.1.7 Procedures Option

415 A Clinical Data Consumer that implements the Procedures Option performs the Mobile Query Existing Data transaction using the vocabulary specified for Procedures in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.7.

X.2.1.8 Encounters Option

420 A Clinical Data Consumer that implements the Encounters Option performs the Mobile Query Existing Data transaction using the vocabulary specified for Encounters in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.8.

X.2.1.9 Document Provenance Option

425 This option is different than the above options that allow the selection of appropriate clinical content to query. It provides a means to extend the traceability of information used for clinical decisions: when a data element is accessed by a Clinical Data Consumer, identifiers from that data element can be retrieved to enable access one or more documents in which this data element was originally recorded, providing a valuable broader clinical context.

A Clinical Data Consumer that implements the Document Provenance Option performs the Mobile Query Existing Data transaction using the vocabulary specified for Provenance in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.9.

430 **X.2.2 Clinical Data Source Options**

X.2.2.1 Simple Observations Option

A Clinical Data Source that implements the Simple Observations Option responds to the message semantics specified for Simple Observations in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.1.

X.2.2.2 Allergies and Intolerances Option

435 A Clinical Data Source that implements the Allergies and Intolerances Option responds to the message semantics specified for Allergies and Intolerances in [PCC-44]4 in PCC TF-2: 3.44.4.1.2.1.2.

X.2.2.3 Conditions Option

440 A Clinical Data Consumer that implements the Conditions Option responds to the message semantics specified for Conditions in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.3.

X.2.2.4 Diagnostic Results Option

A Clinical Data Source that implements the Diagnostic Results Option responds to the message semantics specified for Diagnostic Results in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.4.

X.2.2.5 Medications Option

445 A Clinical Data Source that implements the Medications Option responds to the message semantics specified for Medications in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.5.

X.2.2.6 Immunizations Option

A Clinical Data Source that implements the Immunizations Option responds to the message semantics specified for Immunizations in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.6.

450 **X.2.2.7 Procedures Option**

A Clinical Data Source that implements the Procedures Option responds to the message semantics specified for Procedures in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.7.

X.2.2.8 Encounters Option

455 A Clinical Data Source that implements the Encounters Option responds to the message semantics specified for Encounters in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.8.

X.2.2.9 Document Provenance Option

460 This option is different than the above options that allow the selection of appropriate clinical content to query. It provides a means to extend the traceability of information used for clinical decisions: when a data element is accessed by a Clinical Data Consumer, identifiers from that data element can be provided to the Clinical Data Consumer to enable access one or more documents in which this data element was originally recorded, providing a valuable broader clinical context.

A Clinical Data Source that implements the Document Provenance Option responds to the message semantics specified for Provenance in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.9.

465 **X.3 QEDm Required Actor Groupings**

Table X.3-1: QED for Mobile - Required Actor Groupings

QEDm Actor	Actor to be grouped with	Reference
Clinical Data Consumer	None	-
Clinical Data Source	None	-

X.4 QEDm Overview

X.4.1 Concepts

470 The QEDm Profile supports a broad set of the QED use cases and functionality while keeping the implementation as simple as possible.

X.4.2 Use Cases

X.4.2.1 Use Case #1: Discovery and Retrieval of existing data elements

X.4.2.1.1 Use Case #1 Description

475 In this use case, the patient, by using a mobile device, needs access to existing data elements. For example, a mobile application involved in a workflow needs to discover all the current Observations and Medications.

X.4.2.1.2 Use Case #1 Process Flow

480 The Mobile Query Existing Data transaction is used to provide parameterized queries that result in a list of returned data elements.

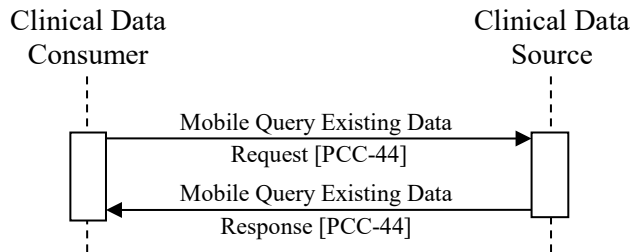


Figure X.4.2.1-1: Use Case #1 Process Flow in QEDm Profile

X.4.2.2 Use Case #2: Discovery and Retrieval of existing data elements with source document links

485 **X.4.2.2.1 Use Case #2 Description**

In this use case, the physician, by using a mobile device, needs to access all existing data elements and eventually to retrieve and consume the source documents if any.

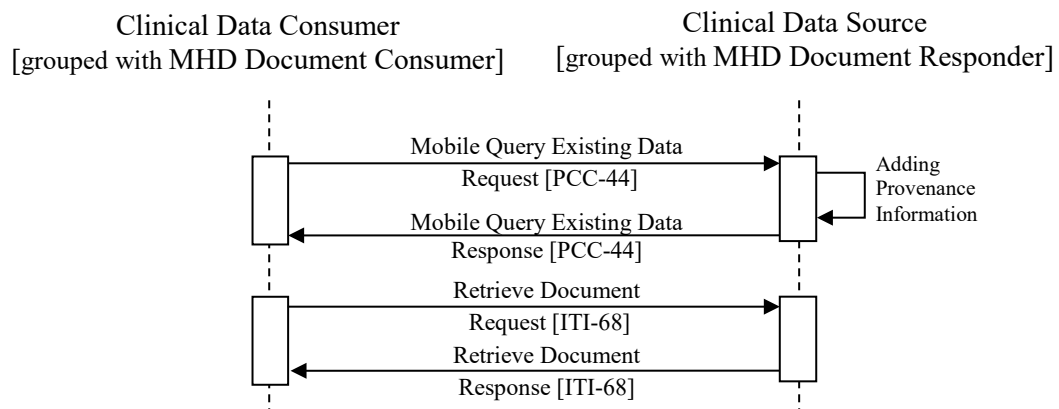
490 For example, a mobile application involved in a workflow needs to discover all Encounters which the patient has participated in and, for those of interest, it needs to retrieve and show the related document where the Encounter was originally specified,

X.4.2.2.2 Use Case #2 Process Flow

The Query for Existing Data for Mobile transaction is used to provide parameterized queries that result in a list of returned data elements. One of the query options specifies that provenance information must be included in the result to obtain the links to source documents, if any.

495 The mobile application implements The Clinical Data Consumer to perform the query.

The mobile application also implements an MHD Document Consumer and retrieves the document from the MHD Document Responder by using the related returned document link.



500

Figure X.4.2.2-1: Use Case #2 Process Flow in QEDm Profile

X.5 QEDm Security Considerations

See ITI TF-2.x Appendix Z.8 “Mobile Security Considerations” for general background on “Mobile” security considerations, and recommendations regarding security.

505 QEDm Profile provides an API for accessing Data Element level details that are identifiable to a specific Patient. Thus all the data communicated, including the query parameters, should be

510 considered Patient Identifiable data. The grouping with IUA, or some similar User Authentication and Authorization solution, is critical to enforcing Privacy and Security. All accesses to this data should be recorded as audit log for security surveillance and Privacy reporting. These topics are discussed in Appendix Z.8 with recommendations.

515 The Document Provenance Option adds an additional protection against Data Integrity and Data Authenticity risks. The Provenance record associated with a Data Element returned by the Clinical Data Source would indicate the source of the data. In the case where Provenance is specific to a Document, grouping with MHD Document Consumer or XDS Document Consumer enables the retrieval of that source Document. The mXDE Profile ITI TF-1:45.5 Security Considerations includes further discussion on the specific Security Considerations of bridging between a Document Sharing environment and a Data Element access model.

X.6 QEDm Cross Profile Considerations

ITI mXDE – Mobile Cross-Enterprise Document Data Element Extraction

520 A Clinical Data Source may be grouped with a Data Element Extractor which requires the addition of necessary provenance information to ensure consistency within each returned data element.

This grouping allows the extraction of data elements and the addition of references to data origins (e.g., Documents) used in generating the result.

525 A Clinical Data Consumer may be grouped with a Data Element Provenance Consumer to extract the identifiers (provenance information) that consistently link the returned data elements to the related data origin.

ITI PIX - Patient Identity Cross Referencing and ITI PDQ - Patient Demographics Query

530 A Clinical Data Consumer may be grouped with a Patient Identifier Cross-reference Consumer or a Patient Demographics Consumer to resolve patient identifiers prior to submitting queries to a Repository.

Within an enterprise, the need to cross-reference patient identifiers may not be necessary. However, once enterprise boundaries are crossed, these identifiers will need to be resolved. In that case profiles such as PIX, PIXm, PDQ and/or PDQm may be used.

ITI MHD – Mobile Health Documents

535 A Clinical Data Source may be grouped with an MHD Document Responder. Data gathered from clinical documents submitted to the Document Responder can be a source of information returned by the Clinical Data Source. It may include references to documents used in generating the QEDm returned data-elements, by using the FHIR Provenance Resource.

540 A Clinical Data Consumer may be grouped with an MHD Document Consumer. The Clinical Data Consumer may use the references to access the source documents.

ITI XDS - Cross-Enterprise Document Sharing

545 A Clinical Data Source may be grouped with an XDS Document Repository. Data gathered from clinical documents submitted to the Document Repository can be a source of information returned by the Clinical Data Source. Information returned by the Clinical Data Source may include references to all documents used in generating the results, by using the FHIR Provenance Resource.

Content Integration Profiles

550 A Content Creator may be grouped with a Clinical Data Consumer to obtain some or all of the information necessary to create a Medical Summary based on information found in a Clinical Data Source.

A Content Creator may be grouped with a Clinical Data Source. When grouped with a Content Creator, the Clinical Data Source shall respond to queries containing the relevant vocabulary codes used by the Content Creator.

555

Volume 2 – Transactions

Add Section 3.44

3.44 Mobile Query Existing Data [PCC-44]

560 This section corresponds to Transaction [PCC-44] of the IHE PCC Technical Framework. Transaction [PCC-44] is used by the Clinical Data Consumer and Clinical Data Source Actors.

3.44.1 Scope

565 The Mobile Query Existing Data transaction is used to query for clinical fine grained data elements that satisfy a set of parameters by using the FHIR framework. The result of the query is a FHIR Bundle containing FHIR clinical data Resources that match the query parameters.

The QEDm Profile assumes that categories and codes referenced by these FHIR Resources need to be defined at the time of deployment. The specification of these FHIR Resources make recommendations on categories and codes that should be considered.

570 3.44.2 Actor Roles

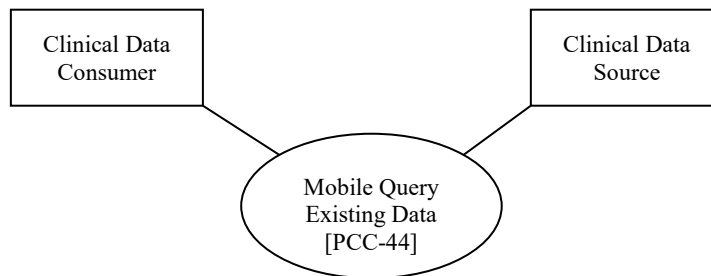


Figure 3.44.2-1: Use Case Diagram

Table 3.44.2-1: Actor Roles

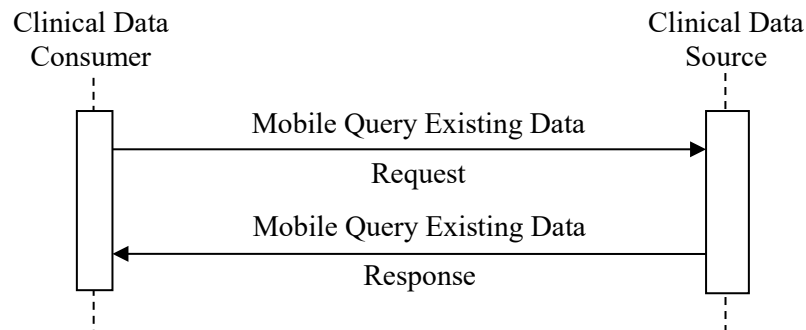
Actor:	Clinical Data Consumer
Role:	Queries the Clinical Data Source for clinical data content. Clinical content requested by the Clinical Data Consumer depends on query options supported by the consumer.
Actor:	Clinical Data Source
Role:	Responds to query, supplying the FHIR Resources representing the clinical data content that match the search criteria provided by the Clinical Data Consumer.

3.44.3 Referenced Standards

HL7 FHIR	HL7® FHIR® standard STU3: http://www.hl7.org/fhir/STU3/index.html
IETF RFC2616	Hypertext Transfer Protocol – HTTP/1.1
IETF RFC7540	Hypertext Transfer Protocol – HTTP/2
IETF RFC3986	Uniform Resource Identifier (URI): Generic Syntax
IETF RFC4627	The application/json Media Type for JavaScript Object Notation (JSON)
IETF RFC6585	Additional HTTP Status Codes

575

3.44.4 Interaction Diagram



3.44.4.1 Mobile Query Existing Data Request message

580 This message uses the HTTP GET method parameterized query to retrieve FHIR Resources representing clinical data matching search parameters in the GET request.

QEDm does not mandate any additional extended or custom method.

3.44.4.1.1 Trigger Events

When the Clinical Data Consumer needs to discover clinical data Resources matching various search parameters it issues a Mobile Query Existing Data message.

585 3.44.4.1.2 Message Semantics

The Clinical Data Consumer executes an HTTP GET against the proper Clinical Data Source’s QEDm URL.

590 The search target follows the FHIR http specification (<http://hl7.org/fhir/STU3/http.html>), addressing the proper FHIR Resource type, according to the supported query options (see Section 3.44.4.1.2.1). The syntax of the FHIR query is:

```
GET [base]/[Resource-type]{?[parameters]}
```


with the following constraints:

- The [base] represents the Service Base URL
- 595 • The [Resource-type] represents the name of the FHIR Resource to consider (each option can involve one or more Resources), as specified in Section 3.44.4.1.2.1
- The [parameters] represents a series of encoded name-value pairs representing the filter for the query, as specified in Section 3.44.4.1.2.1, as well as control parameters to modify the behavior of the Clinical Data Source such as response format, or pagination. See ITI TF-2x: Appendix Z.6 for more details on response format.

600 **3.44.4.1.2.1 Query Search Parameters**

All query parameter values shall be appropriately encoded per RFC3986 “percent” encoding rules. Note that percent encoding does restrict the character set to a subset of ASCII characters which is used for encoding all other characters used in the URL.

605 The FHIR Resource type or types supported by the Clinical Data Consumer and Clinical Data Source are determined by a QEDm named option. An actor claiming named option is required to support the FHIR Resource types listed below. According to the supported option, the Clinical Data Consumer may query and the Clinical Data Source shall be capable of responding on the Resource types specified in Table X.3-2 by processing all the search parameters defined in the following sections.

610 The Clinical Data Source may choose to support additional query parameters beyond the subset defined by the profiling listed below, if done according to the core FHIR specification. Such additional parameters are considered out of scope for this transaction. The Clinical Data Source may ignore any additional parameter not specified in this transaction. See <http://hl7.org/fhir/STU3/search.html#errors>.

615 **Table 3.44.4.1.2.1-1: QEDm Options, FHIR Resources and Query Search Parameters**

QEDm Actor Option	FHIR Resource Type	Reference	Search Parameters
Simple Observations	Observation	http://hl7.org/fhir/STU3/observation.html	See Section 3.44.4.1.2.1.1
Allergies and Intolerances	AllergyIntolerance	http://hl7.org/fhir/STU3/allergyintolerance.html	See Section 3.44.4.1.2.1.2
Condition	Condition (1)	http://hl7.org/fhir/STU3/condition.html	See Section 3.44.4.1.2.1.3
Diagnostic Results	DiagnosticReport	http://hl7.org/fhir/STU3/diagnosticreport.html	See Section 3.44.4.1.2.1.4
Medications	Medication:	http://hl7.org/fhir/STU3/medication.html	See Section 3.44.4.1.2.1.5
	Medication Statement	http://hl7.org/fhir/STU3/medicationstatement.html	

QEDm Actor Option	FHIR Resource Type	Reference	Search Parameters
	Medication Request	http://hl7.org/fhir/STU3/medicationrequest.html	
Immunizations	Immunization	http://hl7.org/fhir/STU3/immunization.html	See Section 3.44.4.1.2.1.6
Procedures	Procedure	http://hl7.org/fhir/STU3/procedure.html	See Section 3.44.4.1.2.1.7
Encounters	Encounter	http://hl7.org/fhir/STU3/encounter.html	See Section 3.44.4.1.2.1.8
Provenance	Provenance	http://hl7.org/fhir/STU3/provenance.html	See Section 3.44.4.1.2.1.9

Note 1: The intended use of FHIR Condition resource includes recording of detailed information about conditions, problems or diagnoses recognized by a clinician.

620 Sections 3.44.4.1.2.1.1 through 3.44.4.1.2.1.9 detail the search parameters combinations to be supported for each of the FHIR Resources designated by a named option.

See ITI TF-2.x: Appendix Z.10 “Profiling conventions for constraints on FHIR” for a description of terms used in the Optionality columns.

3.44.4.1.2.1.1 Simple Observations Option Search Parameters

625 When supporting the Simple Observations Option, the Clinical Data Consumer supplies and the Clinical Data Source shall be at least capable of processing the search parameters combinations as specified by the following table, according to the related optionality.

GET [base]/Observation?[parameters]

Table 3.44.4.1.2.1.1-1: Simple Observations Option Search Parameters

Parameters	Type	Modifiers	Optionality	
			Clinical Data Source	Clinical Data Consumer ⁽¹⁾
patient + category	reference + token		R	O
patient + category + code	reference + token		R	O
patient + category + date	reference + token + date	date modifiers ‘ge’, ‘le’, ‘gt’, ‘lt’	R	O
patient + category + code + date	reference + token + date	date modifiers ‘ge’, ‘le’, ‘gt’, ‘lt’	O	O

Note 1: The Clinical Data Consumer shall support at least one of the search parameters combinations

630 **3.44.4.1.2.1.2 Allergies and Intolerances Option Search Parameters**

When supporting the Allergies and Intolerances Option, the Clinical Data Consumer shall supply and the Clinical Data Source shall be capable of processing the search parameter as specified by the following table.

GET [base]/AllergyIntolerance?[parameters]

635 **Table 3.44.4.1.2.1.2-1: Allergies and Intolerances Option Search Parameters**

Parameters	Type	Optionality	
		Clinical Data Source	Clinical Data Consumer
patient	reference	R	R

3.44.4.1.2.1.3 Conditions Option Search Parameters

640 When supporting the Conditions Option, the Clinical Data Consumer supplies and the Clinical Data Source shall be capable of processing all the search parameters combinations as specified by the following table, according to the related optionality.

GET [base]/Condition?[parameters]

Table 3.44.4.1.2.1.3-1: Conditions Option Search Parameters

Parameters	Type	Optionality	
		Clinical Data Source	Clinical Data Consumer ⁽¹⁾
patient	reference	R	O
patient + category	reference + token	O	O
patient + clinicalStatus	reference + token	O	O

Note 1: The Clinical Data Consumer shall support at least one of the search parameters combinations

3.44.4.1.2.1.4 Diagnostic Reports Option Search Parameters

645 When supporting the Diagnostic Reports Option, the Clinical Data Consumer supplies and the Clinical Data Source shall be capable of processing all the search parameters combinations as specified by the following table, according to the related optionality.

GET [base]/DiagnosticReport?[parameters]

650

Table 3.44.4.1.2.1.4-1: Diagnostic Reposts Option Search Parameters

Parameters	Type	Modifiers	Optionality	
			Clinical Data Source	Clinical Data Consumer ⁽¹⁾
patient + category	reference + token		R	O
patient + category + code	reference + token		R	O
patient + category + date	reference + token + date	date modifiers 'ge','le','gt','lt'	R	O
patient + category + code + date	reference + token + date	date modifiers 'ge','le','gt','lt'	O	O

Note 1: The Clinical Data Consumer shall support at least one of the search parameters combinations

3.44.4.1.2.1.5 Medications Option Search Parameters

655 When supporting the Medications Option, the Clinical Data Consumer shall supply and the Clinical Data Source shall be capable of processing the search parameters as specified by the following tables.

660 The MedicationStatement and MedicationRequest resources can represent a medication, using an external reference to a Medication resource. If an external Medication Resource is used in a MedicationStatement or a MedicationRequest, it can be retrieved by using the `_include` search parameter.

There are no search parameters required for the Medication Resource.

For MedicationStatement:

GET [base]/MedicationStatement?[parameters]

Table 3.44.4.1.2.1.5-1: MedicationStatement Search Parameters

Parameters	Type	<code>_include</code>	Optionality	
			Clinical Data Source	Clinical Data Consumer
patient	reference	MedicationStatement:medication	R	R

665

For MedicationRequest:

GET [base]/MedicationRequest?[parameters]

Table 3.44.4.1.2.1.6-2: MedicationRequest Search Parameters

Parameters	Type	_include	Optionality	
			Clinical Data Source	Clinical Data Consumer
patient	reference	MedicationRequest:medication	R	R

670 **3.44.4.1.2.1.6 Immunizations Option Search Parameters**

When supporting the Immunizations Option, the Clinical Data Consumer may supply and the Clinical Data Source shall be capable of processing the search parameter as specified by the following table.

GET [base]/Immunization?[parameters]

675 **Table 3.44.4.1.2.1.6-1: Immunizations Option Search Parameters**

Parameter	Type	Optionality	
		Clinical Data Source	Clinical Data Consumer
patient	reference	R	R

3.44.4.1.2.1.7 Procedures Option Search Parameters

When supporting the Procedures Option, the Clinical Data Consumer supplies and the Clinical Data Source shall be capable of processing all the search parameters as specified by the following table, according to the related optionality.

680

GET [base]/Procedure?[parameters]

Table 3.44.4.1.2.1.7-1: Procedures Option Search Parameters

Parameter	Type	Modifiers	Optionality	
			Clinical Data Source	Clinical Data Consumer ⁽¹⁾
patient	reference		R	O
patient + date	reference + date	date modifiers 'ge','le','gt','lt'	R	O

Note 1: The Clinical Data Consumer shall support at least one of the search parameters combinations

3.44.4.1.2.1.8 Encounters Option Search Parameters

685 When supporting the Encounters Option, the Clinical Data Consumer supplies and the Clinical Data Source shall be capable of processing all the search parameters as specified by the following table, according to the related optionality.

GET [base]/Encounter?[parameters]

Table 3.44.4.1.2.1.8-1: Encounters Option Search Parameters

Parameter	Type	Modifiers	Optionality	
			Clinical Data Source	Clinical Data Consumer ⁽¹⁾
patient	reference		R	O
patient + date	reference + date	date modifiers 'ge','le','gt','lt'	R	O

690 Note 1: The Clinical Data Consumer shall support at least one of the search parameters combinations

3.44.4.1.2.1.9 Document Provenance Option Search Parameters

695 Clinical Data Consumer supporting this option is enabled to fetch a certain FHIR Resource(s) together with any reference to the original Document from which the Resource(s) has been derived. The FHIR Provenance Resource containing those references can be included by providing the _revinclude parameter in the query.

When supporting the Document Provenance Option, the Clinical Data Consumer shall supply and the Clinical Data Source shall be capable of processing the _revinclude parameter, as defined at: <https://www.hl7.org/fhir/search.html#include>

GET [base]/[Resource-type]?_revinclude=Provenance:target&criteria

700 See Section 3.44.4.2.2.1 for the specification about the Provenance content.

3.44.4.1.2.2 Parameter Modifiers

The Clinical Data Source shall support the “:exact” parameter modifier on all query parameters of type string. When supplied by the Clinical Data Consumer, the “:exact” parameter modifier instructs the Clinical Data Source that exact matching shall be performed.

705 The Clinical Data Consumer should not use and Clinical Data Source may ignore any additional parameter modifiers listed in the FHIR standard, which are considered out of scope in the context of this transaction.

3.44.4.1.2.3 Populating Expected Response Format

710 The FHIR standard provides encodings for responses as either XML or JSON. The Clinical Data Source shall support both message encodings, whilst the Clinical Data Consumer shall support one and may support both.

See ITI TF-2x: Appendix Z.6 for details.

3.44.4.1.3 Expected Actions

715 The Clinical Data Source shall process the query to discover the clinical data FHIR Resource entries (the fine-grained data elements) that match the search parameters given and shall use a FHIR Bundle resource to collect the matching entries to be returned.

The Clinical Data Source shall respond with a Mobile Query Existing Data Response synchronously (i.e., on the same connection as was used to initiate the request).

720 When the Document Provenance Option is specified, the response FHIR Bundle shall also contain FHIR Provenance Resource entries that provide consistency of the returned fine-grained data elements with the coarse-grained data origin (e.g.: Document). See Section 3.44.4.2.2.1 for the specification about the Provenance content. If the fine-grained data element has not been extracted from a document, the Provenance Resource may be absent.

725 See ITI TF-2x: Appendix Z.6 for more details on response format handling. See ITI TF-2x: Appendix Z.7 for handling guidance for Access Denied.

3.44.4.2 Mobile Query Existing Data Response message

The Clinical Data Source returns an HTTP Status code appropriate to the processing as well as a list of the matching clinical data FHIR Resources.

3.44.4.2.1 Trigger Events

730 The Clinical Data Source completed processing of the Mobile Query Existing Data Request message.

3.44.4.2.2 Message Semantics

735 Based on the query results, the Clinical Data Source will either return an error or success. The guidance on handling Access Denied related to use of 200, 403 and 404 can be found in ITI TF-2x: Appendix Z.7 (reproduced here for readability).

When the Clinical Data Source needs to report an error, it shall use HTTP error response codes and should include a FHIR OperationOutcome with more details on the failure. See FHIR <http://hl7.org/fhir/STU3/http.html> and <http://hl7.org/fhir/STU3/operationoutcome.html>.

740 In particular, if a Data Source receives a Mobile Query Existing Data transaction for a resource related to a QEDm Option not supported, it shall return an

operationoutcome.issue.code valued as: ‘not-supported’ and a an
operationoutcome.issue.details valued as: MSG_NO_MATCH No Resource found
matching the query "%s"

745 If the Mobile Query Existing Data request message is processed successfully, whether or not
clinical data Resources are found, the HTTP status code shall be 200.
The Mobile Query Existing Data Response message shall be a FHIR Bundle Resource
containing zero or more clinical data Resources plus optional Provenance Resources (See
Section 3.44.4.2.2.1). If the Clinical Data Source is sending warnings, the Bundle Resource shall
750 also contain an OperationOutcome Resource that contains those warnings.
The response shall adhere to the FHIR Bundle constraints specified in ITI TF-2x: Appendix Z.1.

3.44.4.2.2.1 Document Provenance Option

A QEDm Clinical Data Source Actor, when it supports the Document Provenance Option,
returns FHIR Provenance resources. This actor is part of a document sharing environment which
755 enables it to access the data elements to be returned and the references to original documents.

In this case, the QEDm Clinical Data Source shall return Provenance resources:

- That provide pointers to source documents from which data elements returned via the QEDm [PCC-44] Mobile Query Existing Data were extracted.
- That meet the requirements of the structured definition in Section 3.44.4.2.2.1.1.

760 Note: The Provenance.entity element enables retrieval of a document in at least one of two forms: via MHD and or via XDS.

The QEDm Clinical Data Source may return other FHIR Provenance Resources used for other
purposes than the one defined by the Document Provenance Option of the QEDm Profile.

The FHIR Provenance Resource structure (defined at: <http://hl7.org/fhir/STU3/provenance.html>)
shall allow the provenance of data elements (aka FHIR Resources) to be made available via
765 QEDm queries when they are extracted from documents.

In cases, the same resource may have been extracted from more than one document, then more
Provenance Resources may be created or the same provenance resource may point at several
documents.














By using the Provenance.target in conjunction with the Provenance.entity, the Provenance
770 Resource provides the ability for an XDS or MHD Document Consumer to access the one or
more documents from which a certain data element was extracted.

When no Provenance resource has a Provenance.target pointing at a data-element, it means that
the data-element was not extracted from a document.

The following table shows the detailed constraints for the FHIR Provenance.

775 See ITI TF-2.x Appendix Z.10 “Profiling conventions for constraints on FHIR” for a description
of terms used in the optionality column (Opt.).

Provenance					
Name	Flags	Card.	Opt.	Type	Description & Constraints
 Provenance				DomainResource	Who, What, When for a set of resources Elements defined in Ancestors: id , meta , implicitRules , language , text , contained , extension , modifierExtension ➔ No additional constraints
 target	Σ	1..*	R	Reference(Any)	➔ Target Reference(s): it shall identify each of the resources extracted from documents referenced by provenance.entity
 period		0..1		Period	When the activity occurred ➔ No additional constraints
 recorded	Σ	1..1	R	instant	When the activity was recorded / updated ➔ No additional constraints
 policy		0..*		uri	Policy or plan the activity was defined by ➔ Shall contain: urn:ihe:pcc:qedm:2017:document-provenance-policy
 location		0..1		Reference(Location)	Where the activity occurred, if relevant ➔ No additional constraints
 reason		0..*		Coding	Reason the activity is occurring PurposeOfUse (Extensible) ➔ No additional constraints
 activity		0..1		Coding	Activity that occurred ProvenanceActivityType (Extensible) ➔ No additional constraints
 agent		1..*		BackboneElement	Actor involved
 role	Σ	1..1	R	CodeableConcept	➔ It shall contain: ASSEMBLER
 who[x]	Σ	1..1	R		Who participated: ➔ the Device that performed the extraction shall be specified
 whoUri				uri	
 whoReference				Reference(Device)	
 onBehalfOf[x]		0..1			➔ No additional constraints
 onBehalfOfUri				uri	
 onBehalfOfReference				Reference	
 relatedAgentType		0..1		CodeableConcept	Type of relationship between agents v3 Code System RoleLinkType (Example) ➔ No additional constraints
 entity		0..2	R2	BackboneElement	➔ Entity has two format. This first slice enables access via MHD.

Provenance					
Name	Flags	Card.	Opt.	Type	Description & Constraints
 role	Σ	1..1	R	code	➔ The entity role shall be: source
 what[x]	Σ	1..1	R		Identity of entity
 whatUri				uri	➔ It shall be empty
 whatReference			R	Reference(Any)	➔ It shall contain the reference used to access documents in MHD Profile: - the pointer to the FHIR DocumentReference containing the reference metadata to the document from which the information was derived.
 whatIdentifier				Identifier	➔ It shall be empty
 entity		0..2	R2	BackboneElement	➔ Entity has two formats. This second slice enables access via XDS.
 role	Σ	1..1	R	code	➔ It shall contain: “source”
 what[x]	Σ	1..1			Identity of entity
 whatUri				uri	➔ It shall be empty
 whatReference				Reference(Any)	➔ It shall be empty
 whatIdentifier			R	Identifier	➔ It shall contain the reference used to access documents in XDS Profile: - the XDS RepositoryUniqueId as whatIdentifier.system. - The DocumentId as whatIdentifier.value. The DocumentId that may be used to query the metadata of the document in the XDS Registry or along with the RepositoryUniqueId may be used to retrieve the document from the appropriate XDS Document Repository.
 agent		0..*		see agent	Entity is attributed to this agent ➔ No additional constraints
 signature		0..*		Signature	Signature on target ➔ No additional constraints

780 A FHIR StructureDefinition can be found in implementation materials – see ITI TF-2x: Appendix W for instructions on how to get to the implementation materials.

3.44.4.2.2 Resource Bundling

Resource Bundling shall comply with the guidelines in ITI TF-2x: Appendix Z.1.

The Clinical Data Source shall include all resources to be returned as a contained resource. This means that the query shall return resource data contained in the FHIR Bundle as entries.

785 **3.44.4.2.3 Expected Actions**

The Clinical Data Consumer processes the bundle of resources, received in Transaction [PCC-44] according to the capabilities of its application. These capabilities are not specified by IHE.

If a Clinical Data Consumer cannot automatically recover from an error condition, it should offer a means to make the error accessible to the query initiator (e.g., user, system).

790 **3.44.4.2.3.1 Document Provenance Option**

A Clinical Data Consumer that supports the Document Provenance Option processes the document references contained in the FHIR Provenance resources. The document references enable the Clinical Data Consumer to access the documents from which the data elements were extracted.

795 When a Provenance resource is received with provenance.policy valued at “urn:ihe:pcc:qedm:2017:document-provenance-policy” and provenance.target has a reference for the data element(s) for which a document reference is sought, the Clinical Data Consumer:

- Shall extract from these provenance.entities, the references contained in the provenance.entity to the documents from which the target data-element was extracted.

800 A Clinical Data Consumer that supports the Document Provenance Option shall process all Provenance resources contained in a bundle returned by a [PCC-44] transaction where each provenance resource may include one or more Provenance.target in conjunction with one or more Provenance.entity.

3.44.4.3 Conformance Resource

805 Clinical Data Sources implementing this transaction should provide a Conformance Resource as described in ITI TF-2x: Appendix Z.3 indicating the query operation for the Resources have been implemented and shall include all the supported query parameters.

3.44.5 Security Considerations

The retrieved content contains PHI that shall be protected.

810 See the general Security Considerations in PCC TF-1: X.5.

3.44.5.1 Security Audit Considerations

Grouping a Clinical Data Source with an ATNA Secure Node or Secure Application is required. Grouping a Clinical Data Consumer with an ATNA Secure Node or Secure Application is recommended.

815 The Clinical Data Consumer may be considered overburdened to fully implement the requirements of a Secure Node or Secure Application. The Clinical Data Source is likely a more robust application and shall generate audit messages.

Both actors generate a “Query” Audit Message, which is consistent with ATNA. The Mobile Query Existing Data [PCC-44] is a Query Information event as defined in Table ITI TF-2:3.20.4.1.1.1-1. The message shall comply with the following pattern:

- 820 • Event
 - EventID = EV(110112, DCM, “Query”)
 - EventTypeCode = EV(“PCC-44”, “IHE Transactions”, “Mobile Query Existing Data”)
 - 825 – EventActionCode = “E” (Execute)
- Source of the request (1..1)
 - UserID = The Clinical Data Consumer actor system identity
 - RoleIDCode = EV(110153, DCM, “Source”)
- Human Requestor (0..n) → one for each know User
 - 830 – UserID = Identity of the human that initiated the transaction.
 - RoleIDCode = Access Control role(s) the user holds that allows this transaction
- Destination of the request (1..1)
 - Clinical Data Source actor system identity
 - RoleIDCode = EV(110152, DCM, “Destination”)
- 835 • Audit Source (1..1)
 - not specified
- Patient (1..1)
 - ParticipantObjectTypeCode = “1” (Person)
 - ParticipantObjectTypeCodeRole = “1” (Patient)
 - 840 – ParticipantObjectID = The ‘patient’ parameter value
- Query Parameters (1..1)
 - ParticipantObjectTypeCode = “2” (system object)
 - ParticipantObjectTypeCode Role = “24” (query)
 - 845 – ParticipantObjectIDTypeCode = EV(“PCC-44”, “IHE Transactions”, “Mobile Query Existing Data”)
 - ParticipantObjectQuery = Requested URL including query parameters, base64 encoded

- ParticipantObjectDetail = HTTP Request Headers contained in the query (e.g., Accept header)

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Not applicable.