



HIPS Production Release 4.1.0
Document Consumption Services
Technical and Functional Specification

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Approved for external use

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1. Purpose

The purpose of this document is to specify the functional logic and the technical interfaces for the Document Consumption services provided in the HIPS 4.1 Release, so that the Healthcare Identifier and PCEHR communications solution can be integration tested and deployed by the NEHTA and other interested healthcare groups.

2. Background

NEHTA has a strategic aim to support and facilitate the adoption of national eHealth foundations across the health sector. A key element of delivering on this objective is supporting the implementation of solutions that integrate with the national Healthcare Identifiers Service and the PCEHR system. NEHTA also seeks to collaborate through our implementations projects and, wherever possible, use the lessons learnt and knowledge gained to support the uptake of the national systems, and make that information available to a broader audience, where possible.

The eHealth Integration Sample Code provides implementers and software vendors with a sample implementation of a communications solution that enables patient administration systems and clinical information systems to interact with the Healthcare Identifiers Service and the personally controlled eHealth record system (PCEHR).

3. Service Overview

The Document Consumption functions provided by HIPS include the following services:

- Gain Access to PCEHR
- Get Document List
- Retrieve Document
- Get Change History View
- Prescription and Dispense View
- List Patients in Hospital

4. Patient Identifier

4.1 Functional Logic

4.1.1 Description

The Patient Identifier object will be used to pass the type of Patient Identifier to the method in question. The Patient Identifier can be either:

- MRN
- A Unique State Identifier
- IHI
- Patient Master Identifier

4.2 Technical Structure

4.2.1 Classes

4.2.1.1 *PatientIdentifierBase*

"PatientIdentifierBase" class within the "HIPS.CommonSchemas" project is an abstract class that will be used for the "PatientIdentifier" classes used to pass in patient identifiers to the methods throughout HIPS.

Attributes	Data Type	Description
HospitalCode	String	Code of the hospital
HospitalCodeSystem	String	System Code of the hospital

4.2.1.2 *MRN*

"MRN" class within the "HIPS.CommonSchemas" project is a class that is inherited from "PatientIdentifierBase" class. It is used for calling a function where the patient identifier is an MRN for the methods throughout HIPS.

Attributes	Data Type	Description
MRN	String	Identifier for the Patient

4.2.1.3 *StatePatientIdentifier*

"StatePatientIdentifier" class within the "HIPS.CommonSchemas" project is a class that is inherited from "PatientIdentifierBase" class. It is used for calling a function where the patient identifier is a State Identifier for the methods throughout HIPS.

Attributes	Data Type	Description
StatePatientId	String	Identifier for the Patient

4.2.1.4 *ValidatedIhi*

"ValidatedIhi" class within the "HIPS.CommonSchemas" project is a class that is inherited from "PatientIdentifierBase" class. It is used for calling a function where the patient identifier is an IHI for the methods throughout HIPS.

Attributes	Data Type	Description
Ihi	String	Identifier for the Patient
ihiRecordStatus	ihiReccordStatus / enum	IHI Record Status – Verified/Unverified
ihiStatus	ihiStatus / enum	IHI Status – Active/Deceased/Retured/Resolved/Expired
IhiLastValidated	DateTime	Date and time of last IHI validation
FamilyName	String	Family name of the patient
GivenName	String	Given name of the patient
DateOfBirth	DateTime	Date of birth of the patient
Sex	SexEnumerator	Sex of the patient

4.2.1.5 *PatientMasterId*

"PatientMasterId" class within the "HIPS.CommonSchemas" project is a class that is inherited from "PatientIdentifierBase" class. It is used for calling a function where the patient identifier is a PatientMasterId for the methods throughout HIPS.

Attributes	Data Type	Description
PatientMasterId	int	Identifier for the Patient

4.2.2 Class Diagram

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Figure 1: PatientIdentifier Class diagram

5. HIPS Response

5.1 Functional Logic

5.1.1 Description

This object is used to wrap up the HIPSErrorIndicator and the codes that are returned from the application; whether they are generated from the HIPS, PCEHR or IHI applications.

5.2 Technical Structure

5.2.1 Classes

5.2.1.1 *HipsResponse*

"HipsResponse" class within the "HIPS.CommonSchemas" project is a class that will be used to package the error codes and indicators to return to the client.

Attributes	Data Type	Description
Status	HipsResponseIndicator / enum	Error Codes: The application failed. Details recorded within the application database. SystemError = 0, The request executed correctly OK = 1, The patient was not found with the specified search data InvalidPatient = 2, The hospital was not found with the specified search data InvalidHospital = 3, The episode was not found with the specified search data InvalidEpisode = 4, The document was not found with the specified search data InvalidDocument = 5, The user was not correctly specified InvalidUser = 6, The HI service returned an error HiServiceError = 7, The PCEHR service returned an error PcehrServiceError = 8
ResponseCode	String	Code of the Response

Attributes	Data Type	Description
ResponseCodeDescription	String	Description of the response code
ResponseCodeDetails	String	Optional Additional details of the response
HipsErrorMessage	String	When an error is from HIPS (HipsResponseIndicator : 0) then the error message will be included.

5.2.2 Class Diagram



Figure 2: HipsResponse Class diagram

6. Document Metadata Item

6.1 Functional Logic

6.1.1 Description

This class is used to represent a single document entry (XDSDocumentEntry) which has been returned within a list from the Change History and Document List functions.

6.2 Technical Structure

6.2.1 Classes

6.2.1.1 *DocumentMetaDataItem*

Class "DocumentMetaDataItem" added to the "HIPS.PcehrSchemas" project. Objects of this class are used for individual document items that are returned in the response from the "DocumentList" methods.

Attributes	Data Type	Description
AuthorInstitution	String	The HPI-O of the organisation that authored the document
AuthorInstitutionName	String	The name of the organisation that authored the document
CreationTime	DateTime	The time the document was created
AuthorPerson	String	The identifier of the individual that authored the document.
AuthorPersonFamilyName	String	The family name of the author
AuthorPersonGivenName	String	The given name of the author
AuthorPersonNamePrefix	String	The name prefix of the author
Hash	String	A SHA-1 hash representation of the document.
ServiceStartTime	DateTime	The date and time the service being performed which caused the document to be created started. In the case of a discharge summary, this is the admission date and time.
ServiceStopTime	DateTime	The date and time the service being performed which caused the document to be created stopped. In the case of a discharge summary, this is the discharge date and time.
DocumentSize	Int	The size of the CDA document.

Attributes	Data Type	Description
DocumentStatusCode	DocumentStatus enumeration: Approved = 0 Submitted = 1 Deprecated = 2 Deleted = 3	The status of the individual document.
DocumentClassCode	String	Class code (also called Document Type Code) for the type of document
DocumentClassName	String	Class name (also called Document Type Description) for the type of document
HealthCareFacilityTypeCode	String	Health Care Facility Type Code for the document
HealthCareFacilityTypeName	String	Health Care Facility Type Description for the document
PracticeSettingTypesCode	String	Practice Setting Code (also called Clinical Speciality Codes) of the document
PracticeSettingTypesName	String	Practice Setting Description (also called Clinical Speciality Codes) of the document
FormatCode	String	The format code (also known as template ID) that identifies the validation rules that were applied at the time of upload.
FormatName	String	The display name supplied with the format code.
DocumentUniqueId	String	Unique ID of the document
RepositoryUniqueId	String	This is the identifier of the XDS Repository containing the document.
DocumentEntryUuid	String	The Document Entry UUID. This is the internal identifier of the document within the XDS repository. The NOC requires for the GetChangeHistoryView operation that the document entry UUID is used as the parameter, not the document unique ID.

6.2.2 Class Diagrams

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Figure 3: DocumentMetaDataItem Class diagram

7. Gain PCEHR Access

7.1 Functional Logic

7.1.1 Description

This function is used when a health provider organisation (HPO) wants to gain access to an individual's PCEHR for subsequent viewing and/or downloading information from the PCEHR.

This can be performed:

- With an Access Code (Open Access),
- Without an Access Code or
- With Emergency Access

A call to the "IsPcehrAdvertised" method described in the Document Production specification will return the following access code required for the individual's PCEHR:

- Null – thus meaning that the individual has not registered for PCEHR, or has chosen to hide the existence of his/her PCEHR. The individual may give advice of PCEHR existence and may or may not provide an access code.
- With Code – thus meaning that a code must be provided to gain access
- Without Code – thus meaning that access is open and no Record Code is required. The patient may advise of a Document Code to grant restricted access.
- Access Granted – thus meaning that access has been granted and no code is required unless the patient advises of a change to access level and provides an access code.

As an individual can change their access at any time and so a call to the "IsPcehrAdvertised" method should be performed before each call to the gain access function.

NOTE: The "AccessCodeRequired" for an individual is stored in the HIPS "HealthProviderOrganisationPatient" table after "IsPcehrAdvertised" has been called. However, since this is a transactional system and other calls may already be updating the "AccessCodeRequired" in another thread, it is essential that a call to the "IsPcehrAdvertised" is performed to ensure complete up-to-date values of the "AccessCodeRequired"

7.1.2 Business Rules / Functional Business Logic

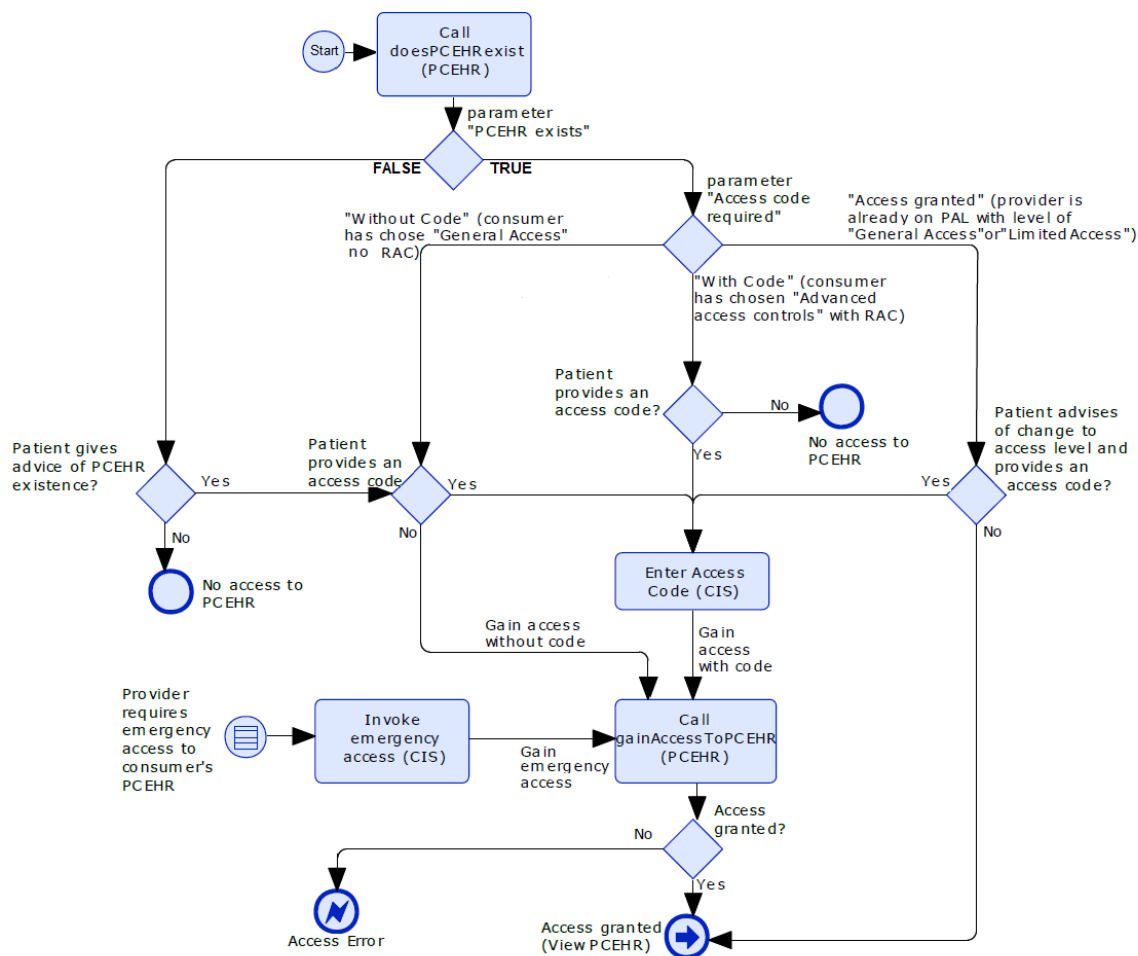


Figure 4: Gain Access Business Logic Diagram from NEHTA

The derived business logic is:

1. The IHI number must be verified and must be added to the PCEHR header. All calls must use the IHI value.
2. With the verified IHI number:
 - a. If Access Type for the individual's PCEHR is "WithCode" then the "AccessType" of the patient must be added into "GainPCEHRAccess">"PCEHRRecord">"AuthorisationDetail" object. This can be either as "AccessCode" or "EmergencyAccess"
 - i. If the "AccessType" is set to "AccessCode" then the individual's PCEHR access code must be added to the GainPCEHRAccess">"PCEHRRecord">"AuthorisationDetail">"AccessCode" field.
 - b. If Access Type for the individual's PCEHR is "WithoutCode" and the individual has not given the provider an access code, and the provider does not choose to assert emergency access, then the "GainPCEHRAccess">"PCEHRRecord">"AuthorisationDetail" object will be set to NULL. If the individual has given the provider an access code or the provider chooses to assert emergency access, then the "AccessType" of the patient must be added into "GainPCEHRAccess">"PCEHRRecord">"AuthorisationDetail" object.

- c. If Access Type for the individual's PCEHR is "AccessGranted " and the individual has not given the provider an access code, and the provider does not choose to assert emergency access, then "GainPCEHRAccess" would not need to be actioned. If the individual has given the provider an access code or the provider chooses to assert emergency access, then "GainPCEHRAccess" must be actioned and the "AccessType" of the patient must be added into "GainPCEHRAccess">"PCEHRRecord">"AuthorisationDetail" object.
- d. If the parameter "PCEHR Exists" is false and therefore the Access Type for the individual's PCEHR is "null":
 - i. If the provider requires emergency access to the PCEHR then the AccessType of EmergencyAccess must be added into the GainPCEHRAccess.
 - ii. Otherwise if the individual has not advised of PCEHR existence then no access is possible and the GainPCEHRAccess must not be actioned.
 - iii. Otherwise if the individual has advised of PCEHR existence but has not provided an access code, then GainPcehrAccess must be actioned and the AuthorisationDetail object will be set to NULL.
 - iv. Otherwise if the individual has provided an access code then GainPcehrAccess must be actioned and the AccessType of AccessCode must be added into the GainPCEHRAccess > PCEHRRecord > AuthorisationDetail object.

7.2 Technical Structure

7.2.1 Classes and Enumerations

7.2.1.1 *GainPcehrAccess*

Class "GainPcehrAccess" added to "HIPS.PcehrBusinessLogic" project. The main logic of the function resides in this class.

7.2.1.2 *GainPcehrAccessResponse*

Class "GainPcehrAccessResponse" added to "HIPS.PcehrSchemas" project. This object is used for the package response from the "GainPcehrAccess" methods.

Attributes	Data Type	Description
hipsResponse	HipsResponse	Common Response Object
AccessPermission	GainPcehrAccessStatus / enum	Status of the Access
ihiNumber	String	Validated IHI number
ihiRecordStatus	ihiReccordStatus / enum	IHI Record Status – Verified/Unverified
ihiStatus	ihiStatus / enum	IHI Status – Active/Deceased/Retured/Resolved/Expired

7.2.1.3 *GainPcehrAccessStatus*

Enumeration "GainPcehrAccessStatus" added to "HIPS.PcehrSchemas" project. This object is used for returning the status of the request to gain access.

Attributes	Description
Permit	Success – PCEHR_SUCCESS (p27, Table 16: NEHTA PCEHR Record Access Service Technical Service Specification v1.4)
Deny	Failure to gain access - All other Gain Access Codes (p27, Table 16: NEHTA PCEHR Record Access Service Technical Service Specification v1.4). Details of the failure will be within the HipsReponse object (Status, ResponseCode and ResposneCodeDescription or possibly the HIPSErrorMessage)

7.2.1.4 *PCEHRService*

"PCEHRService" class within the "HIPS.AppServer.ServiceHost" project will have the "Gain PCEHR Access" methods as listed in "7.2.2 Methods" that will be the exposed end points of the functionality.

7.2.1.5 *IPCEHRService*

"IPCEHRService" class within the "HIPS.ServiceContracts" project will have the service contracts for the "Gain PCEHR Access" methods as listed in "7.2.2 Methods".

7.2.1.6 *PCEHRProxy*

"PCEHRProxy" class within the "HIPS.Client.Proxy" project will have the client proxy methods for the "Gain PCEHR Access" methods as listed in "7.2.2 Methods".

7.2.2 Methods

7.2.2.1 *GainAccessWithCode*

This function is to be used when the individual has given the provider an access code.

Input Parameter	Data Type	Description	Output Parameter	Required/ Optional
PatientIdentifier	PatientIdentifierBase	Any of the Patient Identifier Classes	No	Required
AccessCode	String	Individual's personal Access Code	No	Required
User	UserDetails	Detail of the user making the call	No	Required

Return Parameter	Data Type	Description
response	GainPcehrAccessResponse	GainPcehrAccessResponse Object

7.2.2.2 *GainAccessWithoutCode*

This function is to be used when the individual has advised of the existence of a PCEHR but has not provided an access code, or the PCEHR Access Type does not require an Access Code.

Input Parameter	Data Type	Description	Output Parameter	Required/Optional
PatientIdentifier	PatientIdentifierBase	Any of the Patient Identifier Classes	No	Required
User	UserDetails	Detail of the user making the call	No	Required

Return Parameter	Data Type	Description
response	GainPcehrAccessResponse	GainPcehrAccessResponse Object

7.2.2.3 *GainAccessEmergency*

This function is to be used when the provider has been shown the terms of emergency access and has asserted that emergency access is required to access the individual's PCEHR.

Input Parameter	Data Type	Description	Output Parameter	Required/Optional
PatientIdentifier	PatientIdentifierBase	Any of the Patient Identifier Classes	No	Required
User	UserDetails	Detail of the user making the call	No	Required

Return Parameter	Data Type	Description
response	GainPcehrAccessResponse	GainPcehrAccessResponse Object

7.2.3 External Assembly Dependencies

(Note: The HIPS Server has these dependencies; connecting systems do not.)

- Nehta.VendorLibrary.PCEHR
- Nehta.VendorLibrary.Common

7.2.4 Class Diagrams

Figure 5: GainPCEHRAccess Class Diagram

Figure 5: GainPCEHRAccess Class Diagram

8. DocumentList - registryStoredQuery (ITI-18)

8.1 Functional Logic

8.1.1 Description

This function is used to retrieve a list of documents from the PCEHR repository. There are several standard overloaded GetDocumentList methods for simple queries; if a more complex query is required then the GetDocumentList that uses the DocumentQuery object should be used. This is also described as the getDocumentList() function.

Zero or more listed documents can be returned from this function.

8.1.2 Business Rules / Functional Business Logic

1. The IHI number must be verified and must be added to the PCEHR header. All calls must use the IHI value.
2. If the count of the list of documents from a successful repository request is zero (0) then a GetDocumentListResponse object will still be returned, however the DocumentList attribute will have a null or empty list.
3. For the methods that use the CreationTimeStart, CreationTimeEnd, ServiceTimeStart and ServiceTimeEnd; they are all optional parameters. If null values are passed then the query request will not include those parameters.
4. CreationTimeStart, CreationTimeEnd, ServiceTimeStart and ServiceTimeEnd parameters have a minimum precision value of a second.
5. Entering a value for the parameter for the ServiceTimeStart will enter a query against the ServiceStartTimeFrom to return all documents whose ServiceStartTime is after this value entered.
6. Entering a value for the parameter for the ServiceTimeEnd will enter a query against the ServiceStopTimeTo to return all documents whose ServiceStopTime is before this value entered.
7. Using the DocumentQuery object the DocumentClassCode, DocumentStatus, FormatCode, HealthCareFacilityType and PracticeSettingTypes are all ILists and thus can have 1 or more values passed in.

8.2 Technical Structure

8.2.1 Classes

8.2.1.1 *DocumentList*

Class "DocumentList" added to "HIPS.PcehrBusinessLogic" project. The main logic of the function resides in this class.

8.2.1.2 DocumentQuery

Class "DocumentQuery" added to "HIPS.PcehrSchemas" project. This object holds all query parameters that are to be sent to the document registry for retrieval.

Attributes	Data Type	Description
DocumentStatus	IList <DocumentStatus> / enum	Document Status Types
DocumentUniqueId	String	Unique ID for searching a single document
DocumentClassCode	IList <DocumentClassCode> /enum	Class codes (also called Document Type Codes) for the type of document. Extended from the NEHTA APIs.
PracticeSettingTypes	IList <PracticeSettingType> /enum	Practice Settings (also called Clinical Speciality Codes) of the document. Extended from the NEHTA APIs.
HealthCareFacilityType	IList <HealthCareFacilityType> /enum	Health Care Facility Type for the document. Extended from the NEHTA APIs.
CreationTimeFrom	DateTime	Minimum value for the document creation date and time.
CreationTimeTo	DateTime	Maximum value for the document creation date and time.
ServiceStartTimeFrom	DateTime	Minimum value for the date and time at which the healthcare service started.
ServiceStartTimeTo	DateTime	Maximum value for the date and time at which the healthcare service started.
ServiceStopTimeFrom	DateTime	Minimum value for the date and time at which the healthcare service stopped.
ServiceStopTimeTo	DateTime	Maximum value for the date and time at which the healthcare service stopped.
FormatCode	IList <String>	Format codes for document conformance.

8.2.1.3 DocumentListResponse

Class "DocumentListResponse" added to the "HIPS.PcehrSchemas" project. This object is used for the package response from the "DocumentList" methods.

Attributes	Data Type	Description
hipsResponse	HipsResponse	Common Response Object

Attributes	Data Type	Description
PatientIdentifier	PatientIdentifierBase	Patient Identifier Class that matches the same object that was used as the passed in PatientIdentifier Class
ihNumber	String	IHI number (for those requests where the IHI was not used as a parameter the IHI that was returned from the PCEHR is also added)
DocumentList	IList <DocumentMetaItem>	Document List of the Document Meta Data Items

8.2.1.4 PCEHRService

"PCEHRService" class within the "HIPS.AppServer.ServiceHost" project will have the "Get Document List" methods as listed in "8.2.2 Methods" that will be the exposed end points of the functionality.

8.2.1.5 IPCEHRService

"IPCEHRService" class within the "HIPS.ServiceContracts" project will have the service contracts for the "Get Document List" methods as listed in "8.2.2 Methods".

8.2.1.6 PCEHRProxy

"PCEHRProxy" class within the "HIPS.Client.Proxy" project will have the client proxy methods for the "Get Document List" methods as listed in "8.2.2 Methods".

8.2.2 Methods

There are several standard methods that are provided and are also overridden to add extra query functionality.

8.2.2.1 GetDocumentList [All]

This function is used to retrieve the list of all documents for a patient.

Input Parameter	Data Type	Description	Output Parameter	Required/Optional
PatientIdentifier	PatientIdentifierBase	Any of the Patient Identifier Classes	No	Required
User	UserDetails	Detail of the user making the call	No	Required
Return Parameter	Data Type	Description		
response	DocumentListResponse	DocumentListResponse Object		

8.2.2.2 *GetDocumentList [All - Date Filter]*

This function is used to retrieve the list of all documents for a patient filtering by Creation and Service Start and End Times

Input Parameter	Data Type	Description	Output Parameter	Required/Optional
PatientIdentifier	PatientIdentifierBase	Any of the Patient Identifier Classes	No	Required
User	UserDetails	Detail of the user making the call	No	Required
CreationTimeStart	DateTime	Beginning time for Creation Time filter	No	Optional and Nullable
CreationTimeEnd	DateTime	End time for Creation Time filter	No	Optional and Nullable
ServiceTimeStart	DateTime	Beginning time for Service Time filter	No	Optional and Nullable
ServiceTimeEnd	DateTime	End time for Service Time filter	No	Optional and Nullable
Return Parameter	Data Type	Description		
response	DocumentListResponse	DocumentListResponse Object		

8.2.2.3 *GetDocumentList [Status & Date Filter]*

This function is used to retrieve the list of documents for a patient filtering Document Statuses and by Creation and Service Start and End Times.

Input Parameter	Data Type	Description	Output Parameter	Required/Optional
PatientIdentifier	PatientIdentifierBase	Any of the Patient Identifier Classes	No	Required
User	UserDetails	Detail of the user making the call	No	Required
DocumentStatus	DocumentStatus / enum	Document Status Types	No	Required

Input Parameter	Data Type	Description	Output Parameter	Required/Optional
CreationTimeStart	DateTime	Beginning time for Creation Time filter	No	Optional
CreationTimeEnd	DateTime	End time for Creation Time filter	No	Optional
ServiceTimeStart	DateTime	Beginning time for Service Time filter	No	Optional
ServiceTimeEnd	DateTime	End time for Service Time filter	No	Optional
Return Parameter	Data Type	Description		
response	DocumentListResponse	DocumentListResponse Object		

8.2.2.4 *GetDocumentListActive [Only Active Documents]*

This function is used to retrieve the list of only active documents for a patient. (Note: This is a document status of Approved)

Input Parameter	Data Type	Description	Output Parameter	Required/Optional
PatientIdentifier	PatientIdentifierBase	Any of the Patient Identifier Classes	No	Required
User	UserDetails	Detail of the user making the call	No	Required
Return Parameter	Data Type	Description		
response	DocumentListResponse	DocumentListResponse Object		

8.2.2.5 *GetDocumentListActive [All - Date Filter]*

This function is used to retrieve the list of only active documents for a patient filtering by Creation and Service Start and End Times. (Note: This is a document status of Approved)

Input Parameter	Data Type	Description	Output Parameter	Required/Optional
PatientIdentifier	PatientIdentifierBase	Any of the Patient Identifier Classes	No	Required
User	UserDetails	Detail of the user making the call	No	Required
CreationTimeStart	DateTime	Beginning time for Creation Time filter	No	Optional
CreationTimeEnd	DateTime	End time for Creation Time filter	No	Optional
ServiceTimeStart	DateTime	Beginning time for Service Time filter	No	Optional
ServiceTimeEnd	DateTime	End time for Service Time filter	No	Optional

Return Parameter	Data Type	Description
response	DocumentListResponse	DocumentListResponse Object

8.2.2.6 *GetDocumentList [Query Object]*

This function is used to retrieve the list of documents filtering by using the DocumentQuery Object. If a null DocumentQuery object is passed to this method then it will perform the search as the GetDocumentList method in "8.2.2.1 GetDocumentList [All]"

Input Parameter	Data Type	Description	Output Parameter	Required/Optional
PatientIdentifier	PatientIdentifierBase	Any of the Patient Identifier Classes	No	Required
User	UserDetails	Detail of the user making the call	No	Required
DocumentQuery	DocumentQuery	DocumentQuery object with the queried items	No	Required

Return Parameter	Data Type	Description
response	DocumentListResponse	DocumentListResponse Object

8.2.3 External Assembly Dependencies

(Note: The HIPS Server has these dependencies; connecting systems do not.)

Nehta.VendorLibrary.PCEHR

Nehta.VendorLibrary.Common

8.2.4 Class Diagrams



Figure 6: DocumentQuery Class Diagram

Figure 7: DocumentList Class Diagram

9. Download Document - Retrieve Document Set (ITI-43)

9.1 Functional Logic

9.1.1 Description

This function is used to retrieve a single XDS document element. ("DEXS-T 19" & "DEXS-T 21" from "PCEHR Document Exchange Service IHE XDS-b Technical Service Specification v1.3"). This is also described as the `getDocument()` function.

9.1.2 Business Rules / Functional Business Logic

1. Only a single document is returned from each call.
2. The returned document is unpacked and unencrypted as a CDA document along with any attachment files included in the package.
3. If the Save Document flag in the Document Request parameter is set, then HIPS will save a copy of the downloaded document in the Downloaded Document table in the local database.
4. If the consumer's IHI, date of birth, sex or family name in the downloaded document does not match the relevant stored information for the patient, a Demographic Mismatch Warning will be returned in the HIPS response. It is recommended that a user-facing application displaying the document makes this warning visible to the user.

9.2 Technical Structure

9.2.1 Classes

9.2.1.1 *DownloadDocument*

Class "DownloadDocument" added to "HIPS.PcehrBusinessLogic" project. The main logic of the function resides in this class.

9.2.1.2 *DocumentRequest*

Class "DocumentRequest" added to "HIPS.PcehrSchemas" project. This object holds the attributes that are to be sent to the document registry for a single document retrieval.

Attributes	Data Type	Description
RepositoryUniqueId	String	Identifier of the XSD Repository
DocumentUniqueId	String	Unique ID for searching a single document
SaveDocument	Boolean	Whether to save a copy of the downloaded document.

9.2.1.3 *DocumentResponse*

Class "DocumentResponse" added to "HIPS.PcehrSchemas" project. This object holds the single document retrieved from the repository.

Attributes	Data Type	Description
hipsResponse	HipsResponse	Common Response Object
RepositoryUniqueId	String	Identifier of the XSD Repository
DocumentUniqueId	String	Unique ID for searching a single document
MimeType	String	Mime Type of the document returned
Document	String	Document in unpacked and unencrypted CDA format.
Attachments	Array of Attachment	Files included in the package

9.2.1.4 Attachment

Class "Attachment" is located in the "HIPS.PcehrSchemas" project. This object represents a file that is attached to a document that is uploaded or downloaded from a PCEHR repository.

Attributes	Data Type	Description
FileName	String	The name of the file, e.g. "LOGO.PNG" or "DOCUMENT.PDF"
Contents	Binary	File Contents
MimeType	String	Mime Type of the document returned

9.2.1.5 PCEHRService

"PCEHRService" class within the "HIPS.AppServer.ServiceHost" project will have the "Get Document" methods as listed in "9.2.2 Methods" that will be the exposed end points of the functionality.

9.2.1.6 IPCEHRService

"IPCEHRService" class within the "HIPS.ServiceContracts" project will have the service contacts for the "Get Document" methods as listed in "9.2.2 Methods".

9.2.1.7 PCEHRProxy

"PCEHRProxy" class within the "HIPS.Client.Proxy" project will have the client proxy methods for the "Get Document" methods as listed in "9.2.2 Methods".

9.2.2 Methods

9.2.2.1 RetrieveDocument

This function is used to get a single document from the repository.

Input Parameter	Data Type	Description	Output Parameter	Required/Optional
PatientIdentifier	PatientIdentifierBase	Any of the Patient Identifier Classes	No	Required
User	UserDetails	Detail of the user making the call	No	Required
request	DocumentRequest	Requested document	No	Required

Return Parameter	Data Type	Description
response	DocumentResponse	DocumentResponse Object

9.2.2.2 *CheckText*

This function is used to check the text values within a valid CDA document to look for known embedded security issues. This process is a simple text check for any scripted executable code within the text. This can be accomplished by using the HTMLAgilityPack to remove script tags and embedded code from the text and then if appropriate to remove any other HTML characters using HTMLEncode – this is highly dependent on if the data is going to be rendered within the an HTML page or displayed in another form.

9.2.3 External Assembly Dependencies

(Note: The HIPS Server has these dependencies; connecting systems do not.)

Nehta.VendorLibrary.PCEHR

Nehta.VendorLibrary.Common

9.2.4 Class Diagrams

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Figure 8: DownloadDocument Class Diagram

10. ChangeHistoryView

10.1 Functional Logic

10.1.1 Description

This function is used to retrieve a list of all versions of a document from the PCEHR repository, that are previous or subsequent versions of to a single identified document instance. The documents that are returned are the historical documents from a document tree.

10.1.2 Business Rules / Functional Business Logic

1. The IHI number must be verified and must be added to the PCEHR header. All calls must use the IHI value.
2. The unique document ID, which is passed to this method, can be any of the unique document IDs that are within the historical document tree. Thus, no matter which unique document ID is passed all historical documents from the set will be returned.

10.2 Technical Structure

10.2.1 Classes

10.2.1.1 *ChangeHistoryView*

Class "ChangeHistoryView" added to "HIPS.PcehrBusinessLogic" project. The main logic of the function resides in this class.

10.2.1.2 *ChangeHistoryViewResponse*

Class "ChangeHistoryReviewReponse" added to the "HIPS.PcehrSchemas" project. This object is used for the package response from the "ChangeHistoryView" methods.

Attributes	Data Type	Description
hipsResponse	HipsResponse	Common Response Object
PatientIdentifier	PatientIdentifierBase	Patient Identifier Class that matches the same object that was used as the passed in PatientIdentifier Class
ihiNumber	String	IHI number (for those requests where the IHI was not used as a parameter the IHI that was returned from the PCEHR is also added)
DocumentList	IList <DocumentMetaDataItem>	List of the Document Meta Data Items

10.2.1.3 *PCEHRService*

"PCEHRService" class within the "HIPS.AppServer.ServiceHost" project will have the "Change History View" methods as listed in "10.2.2 Methods" that will be the exposed end points of the functionality.

10.2.1.4 IPCEHRService

"IPCEHRService" class within the "HIPS.ServiceContracts" project will have the service contacts for the "Change History View" methods as listed in "10.2.2 Methods".

10.2.1.5 PCEHRProxy

"PCEHRProxy" class within the "HIPS.Client.Proxy" project will have the client proxy methods for the "Change History View" methods as listed in "10.2.2 Methods".

10.2.2 Methods

10.2.2.1 GetChangeHistoryView

This function is used to retrieve the list of all historical documents related to the same document set for a patient.

Input Parameter	Data Type	Description	Output Parameter	Required/Optional
PatientIdentifier	PatientIdentifierBase	Any of the Patient Identifier Classes	No	Required
User	UserDetails	Detail of the user making the call	No	Required
DocumentUniqueId	String	ID of the document	No	Required
Return Parameter	Data Type	Description		
response	ChangeHistoryReviewReponse	ChangeHistoryReviewReponse Object		

10.2.3 External Assembly Dependencies

(Note: The HIPS Server has these dependencies; connecting systems do not.)

Nehta.VendorLibrary.PCEHR

Nehta.VendorLibrary.Common

10.2.4 Class Diagrams



Figure 9: ChangeHistoryView Class Diagram

Figure 10: DownloadDocument Class Diagram

11. Get View

11.1 Functional Logic

11.1.1 Description

This function is used to access a PCEHR view service, using the parameters that are defined for the view service, and receive the results as a CDA document.

This version of HIPS supports only the Prescription and Dispense View, however, the web service interface is designed to be extended to support any PCEHR view service that is available via the 'GetView' interface.

11.1.2 Business Rules / Functional Business Logic

1. The "patientIdentifier" object which is passed to this method must be an instance of "Mrn", "PatientMasterId", "StatePatientId" or "VerifiedIhi". The patient must be identified with a verified IHI number. HIPS will ensure that the IHI number is verified and added to the PCEHR header. All calls must use the IHI value.
2. The "user" object which is passed to this method must contain the name, role and identifier of the person responsible for the action, who is typically the interactive user of the clinical system. If the HPI-I of the person is known, the Role must be "ProviderIndividual" and the HPI-I must be provided.
3. The "parameters" object which is passed to this method must be an instance of "PrescriptionAndDispenseViewRequest" which is the only concrete subclass of the abstract base class 'ViewParametersBase' in this version of HIPS.

11.2 Technical Structure

11.2.1 Classes

11.2.1.1 *GetViewInvoker*

Class "GetViewInvoker" has been added to "HIPS.PcehrBusinessLogic" project. The main logic of the function resides in this class.

11.2.1.2 *ViewRequestBase*

Class "ViewRequestBase" has been added to "HIPS.PcehrSchemas" project. This is an abstract base class that all PCEHR view request classes will inherit from.

11.2.1.3 *PrescriptionAndDispenseViewRequest*

Class "PrescriptionAndDispenseViewRequest" has been added to "HIPS.PcehrSchemas" project. This is a concrete subclass of "ViewRequestBase" that contains the parameters required for the Prescription and Dispense View.

Attributes	Data Type	Description
FromDate	Date	The earliest date of prescription or dispense clinical event (serviceStopTime) that will appear in the view.
ToDate	Date	The latest date of prescription or dispense clinical event (serviceStopTime) that will appear in the view.

11.2.1.4 ViewResponse

Class "ViewReponse" has been added to the "HIPS.PcehrSchemas" project. This object is used for the response from the "GetView" web service method.

Attributes	Data Type	Description
Document	Binary	The view results as a document in unpacked and unencrypted CDA format.
FileName	String	The file name of the document within the CDA package, which is always "CDA_ROOT.XML".
TemplateId	String	OID identifying the document format. The CDA validation rules for this document format may be obtained from the Template Service using this OID.
MimeType	String	MIME type of the document returned, which is always "text/xml".
HipsResponse	HipsResponse	Common Response Object
Attachments	Array of Attachment	Files included in the package

11.2.1.5 PCEHRService

"PCEHRService" class within the "HIPS.AppServer.ServiceHost" project will have the "Get View" methods as listed in "10.2.2 Methods" that will be the exposed end points of the functionality.

11.2.1.6 IPCEHRService

"IPCEHRService" interface within the "HIPS.ServiceContracts" project will have the service contracts for the "Get View" methods as listed in "10.2.2 Methods".

11.2.1.7 PCEHRProxy

"PCEHRProxy" class within the "HIPS.Client.Proxy" project will have the client proxy methods for the "Get View" methods as listed in "10.2.2 Methods".

11.2.2 Methods

11.2.2.1 *GetView*

This function is used to retrieve a view from the PCEHR system.

Input Parameter	Data Type	Description	Output Parameter	Required/Optional
patientIdentifier	PatientIdentifierBase	Any of the Patient Identifier Classes	No	Required
user	UserDetails	Detail of the user making the call	No	Required
request	ViewRequestBase	Parameters to the PCEHR view	No	Required
Return Parameter	Data Type	Description		
response	ViewReponse	ViewReponse Object		

11.2.3 External Assembly Dependencies

(Note: The HIPS Server has these dependencies; connecting systems do not.)

Nehta.VendorLibrary.PCEHR

Nehta.VendorLibrary.Common

11.2.4 Class Diagrams



Figure 11: GetView Class Diagram

12. List Patients in Hospital

12.1 Functional Logic

12.1.1 Description

This function is used to access a list of patients in hospital who have an active verified IHI. The list can be filtered to show a single hospital or a set of hospitals, to include patients with or without a PCEHR, and to include patients who were discharged within a specified number of days.

12.1.2 Business Rules / Functional Business Logic

1. The "user" object which is passed to this method must contain the name, role and identifier of the person responsible for the action, who is typically the interactive user of the clinical system. Although this function does not access the HI Service or PCEHR system, any errors that occur during the operation will be logged with the user's identity.
2. If a hospital code is provided, the "hospitalCodeSystem" object which is passed to this method acts to scope the hospital code.
3. If no hospital code is provided, filter the set of hospitals whose patients are included in the results.
4. While there may be several episodes that fall within the specified number of days since discharge, only one record is returned for each patient in each hospital, with the details from the most recent matching episode.
5. Matching patients are either current inpatients (as created by an ADT-A01 message) or recently discharged inpatients (as created by an ADT-A03 message), and must have an active verified IHI.

12.2 Technical Structure

12.2.1 Classes

12.2.1.1 *PatientListLogic*

Class "PatientListLogic" has been added to "HIPS.PatientBusinessLogic" project. The main logic of the function resides in this class.

12.2.1.2 *PatientListResponse*

Class "PatientListResponse" has been added to the "HIPS.PatientSchemas" project. This object is used for the response from the "ListPatientsInHospital" web service method.

Attributes	Data Type	Description
HipsResponse	HipsResponse	Common Response Object
PatientInHospitalList	List of PatientInHospital	A list of patient records matching the criteria

12.2.1.3 PatientInHospital

Class "PatientInHospital" has been added to the "HIPS.PatientSchemas" project. This object represents a single patient that matches the criteria specified in the web service method.

Attributes	Data Type	Description
Ihi	String	Patient's IHI number
IhiStatus	IhiStatus	IHI Status of the patient's IHI
IhiRecordStatus	IhiRecordStatus	IHI Record Status of the patient's IHI
IhiLastValidated	Date and Time	When the IHI was last checked at HI Service
DateOfBirth	Date and Time	Patient's date of birth
MedicareNumber	String	Patient's Medicare card number
MedicareIrn	String	Patient's Medicare IRN
DvaNumber	String	Patient's DVA file number
CurrentSex	SexEnumerator	Patient's sex on the PAS
FamilyName	String	Patient's family name on the PAS
GivenNames	String	Patient's given names on the PAS
RegisteredSex	SexEnumerator	Patient's sex on the HI Service
Registered FamilyName	String	Patient's family name on the HI Service
Registered GivenName	String	Patient's given names on the HI Service
Suffix	String	Patient's name suffixes ('Jr', 'Snr')
Title	String	Patient's name titles ('Mrs', 'Ms', 'Mr', 'Dr')
HospitalId	Integer	HIPS internal identifier for the hospital
HospitalCode	String	Code that identifies the hospital in the specified code system.
HospitalName	String	Hospital's name
Mrn	String	Patient's Medical Record Number
Ward	String	Ward component of patient location
Room	String	Room component of patient location
Bed	String	Bed component of patient location
AdmissionDate	Date and Time	When patient was admitted to hospital
DischargeDate	Date and Time	When patient was discharged from hospital
ResponsibleProviderFamilyName	String	Attending or consulting doctor's family name
ResponsibleProviderGivenNames	String	Attending or consulting doctor's given names

Attributes	Data Type	Description
ResponsibleProviderTitle	String	Attending or consulting doctor's name titles
ResponsibleProviderSuffix	String	Attending or consulting doctor's name suffixes
ParticipationStatus	ParticipationStatus enumeration: <ul style="list-style-type: none"> NoValidIhi PcehrNotAdvertised PcehrAdvertised RequestedUpload 	Indicates the existence information for the patient's PCEHR was: <ul style="list-style-type: none"> Unavailable due to bad IHI No evidence of existence Found using DoesPCEHRExist Disclosed by the patient

12.2.1.4 PatientService

"PatientService" class within the "HIPS.AppServer.ServiceHost" project will implement the methods as listed in "12.2.2 Methods".

12.2.1.5 IPatientService

"IPatientService" interface within the "HIPS.ServiceContracts" project will define the service contracts for the methods as listed in "12.2.2 Methods" that will be the exposed end points of the functionality.

12.2.1.6 PatientProxy

"PatientProxy" class within the "HIPS.Client.Proxy" project will have the client proxy methods for the methods as listed in "12.2.2 Methods".

12.2.2 Methods

12.2.2.1 ListPatientsInHospital

This method is used to retrieve a list of patients from the HIPS database.

Input Parameter	Data Type	Description	Required/Optional
user	UserDetails	Detail of the user making the call	Required
hospitalCodeSystem	String	The code system to which the hospital code belongs.	Required
hospitalCode	String	A code in the specified code system that identifies the hospital whose patients should be listed. When not specified, HIPS will list patients in all hospitals that have a code in the specified code system.	Optional
withPcehr	Boolean	When true, HIPS will list patients that appear to have a PCEHR. When false, HIPS will list patients that do not appear to have a PCEHR. When not specified, HIPS will list patients regardless of whether they appear to have a PCEHR.	Optional
daysDischarged	Integer	Number of days after discharge that patients are included in the list. Set to 0 to list only currently admitted patients.	Required

Return Parameter	Data Type	Description
response	PatientListResponse	Encapsulates the list of patients and any service messages.

12.2.3 External Assembly Dependencies

None

12.2.4 Class Diagrams



Figure 12: PatientService Class Diagram