



**HIPS UI Release 1.0.0**

**National Prescription and Dispense Repository  
PCEHR Web Viewer Web Design Specification**

13 February 2014

Approved for external use

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# Document Information

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## Document Version History

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# 1. Introduction

## 1.1 Context

The National Prescription and Dispense Repository (NPDR) is available as an aspect of the eHealth record maintained via the PCEHR service. It provides for the creation of an online medication history (not retrospective) for patients with an eHealth record based on information collected at the point of prescription and the point of dispensing. In addition, the Prescription and Dispense View displays information entered by healthcare providers relating to the medications prescribed and dispensed to patients with an eHealth record.

The HIPS NPDR project will extend the core HIPS product with the following key capabilities for interacting with the NPDR:

- Uploading Prescription records to the NPDR.
- Uploading Dispense records to the NPDR.
- Accessing the Prescription and Dispense View.

As an extension of the core services provided by the HIPS product, the HIPS-UI product packages mobile and web-based user interfaces for fulfilling common interaction requirements with the PCEHR, including assisted registration and HPI-I search. In addition to the capabilities listed above, the HIPS NPDR project will extend the HIPS-UI product to provide:

- PCEHR Web Viewer, providing patient search, clinical document viewing and combined prescription and dispense views.

## 1.2 Purpose

This document will:

- Specify and agree the requirements for the HIPS-UI capabilities required to support the "PCEHR Web Viewer" feature of the HIPS NPDR project, specifically with regard to the Web components of the HIPS-UI product (referred to as HIPS-UI Web).
- Capture the high-level functional and technical design anticipated to realise these requirements.

## 1.3 Scope

This document specifies the requirements and design only for the HIPS-UI Web components required to support the HIPS NPDR project Scope Inclusion 4:

*Develop a PCEHR Web Viewer application which enables approved clinicians to view clinical documents downloaded from the PCEHR for patients in hospital. This will include listing and viewing PCEHR documents (including Discharge Summaries, Health Summaries, Event Summaries, and Specialist letters) and the combined view of Prescription and Dispense records for a selected patient in hospital.*

*The PCEHR Web Viewer will be developed such that it is ready for integration to a hospital's localised CIS. This means that it will have passed the CCA requirements that are possible to be tested without the PCEHR Web Viewer actually being implemented at a hospital site and will have functionality such as a security model that ensures only approved clinicians use the PCEHR Web Viewer. However, it is possible that on integration of the PCEHR Web Viewer to the hospital's local CIS, that there are local requirements for security and other CCA requirements peculiar to that hospital site. This integration may require localised customisations, which will be out of scope for this Agreement and would require additional work as part of a new project.*

*The PCEHR Web Viewer will also be available for demonstrating and testing the view capability of HIPS.*

The implementation of this project Scope Inclusion within the HIPS-UI Web product will subsequently be referred to within this document as simply the "PCEHR Web Viewer".

For further information regarding HIPS NPDR project Scope Inclusions, refer to the "Scope" section of [RR-1] ([Related Resources](#)).

## 1.4 Project Considerations

### 1.4.1 Project Delivery Cycles

The HIPS NPDR project will be structured to include a number of iterations for delivering the PCEHR Web Viewer. Each iteration will build upon the capabilities delivered in the previous cycle.

Iteration	Description
4A – PCEHR Web Viewer – List & View all Clinical Documents	Delivers the "... listing and viewing PCEHR documents (Discharge Summaries, Health Summaries, Event Summaries, and Specialist letters) ... for a selected patient in hospital" capability of the PCEHR Web Viewer.
4B – PCEHR Web Viewer – View Combined Prescriptions & Dispensing	Delivers the "... combined view of Prescription and Dispense records ... for a selected patient in hospital" capability of the PCEHR Web Viewer.
4C – PCEHR Web Viewer – Add CCA Requirements	Delivers a number of additional functional and non-functional capabilities to the PCEHR Web Viewer to ensure "it is ready for integration to a hospital's localised CIS. This means that it will have passed the CCA requirements that are possible to be tested without the PCEHR Web Viewer actually being implemented at a hospital site and will have functionality such as a security model that ensures only approved clinicians use the PCEHR Web Viewer".
4D – PCEHR Web Viewer – Feedback & Revision	Provides an opportunity to obtain, analyse and address feedback related to the PCEHR Web Viewer from previous iterations.

It is anticipated the contents of this document will also be constructed iteratively as more detailed analysis and design is performed for each iteration.

## 1.4.2 Assumptions

The following project assumptions may affect the requirements and design within this document.

<b>ID</b>	<b>Description</b>
PA-1	The capabilities of the PCEHR Web Viewer are based on similar features implemented by other eHealth implementers, with the assumption that these capabilities represent a usable baseline for a generic PCEHR Web Viewer.

## 1.5 Related Resources

<b>ID</b>	<b>Document</b>	<b>Description</b>
RR-1	Variation to Contract for Services: HIPS Support and Build, dated 13 December 2013 – Annexure D – Work Package 4 – HIPS National Prescription and Dispense Repository (NDPR) Project	Defines high-level project scope, deliverables and schedule.
RR-2	HIPS NPDR Project Plan 0.1	Describes the project approach and plan.
RR-3	PCEHR Prescription and Dispense View - Conformance Profile - Version 1.2	Describes the conformance requirements for the prescription and dispense view.
RR-4	NEHTA PCEHR Prescription and Dispense View Presentation Guide 1.0	Describes the presentation requirements for the prescription and dispense view.
RR-5	Clinical Information Systems Connecting to the PCEHR System - Conformance Requirements - Version 1.5	Describes the conformance requirements for a CIS connecting to the PCEHR.
RR-6	Clinical Information Systems Connecting to the PCEHR System - Use Cases - Version 1.1	Enumerates the use cases for a CIS connecting to the PCEHR,
RR-7	Clinical Information Systems Connecting to the PCEHR System - Conformance Test Specification - Version 1.6	Enumerates CCA test cases for a CIS connecting to the PCEHR.
RR-8	Clinical Documents - Common Conformance Profile - Version 1.4	Describes the conformance requirements for producers and consumers of clinical documents.
RR-9	Clinical Documentation - CDA Rendering Specification - Version 1.0	Specifies the requirements for rendering of CDA documents.
RR-10	CDA Rendering - Conformance Test Specification - Version 1.3	Enumerates CCA test cases for rendering of CDA documents.
RR-11	Clinical Document - Generic CDA Stylesheet - Version 1.2.8	Generic CDA stylesheet provided by NEHTA for the rendering of CDA documents and associated "readme" file.
RR-12	NEHTA Prescription and Dispense View Presentation Guide – Conformance Test Specification – Version	Enumerates CCA test cases for rendering the prescription and dispense view.

## 2. Requirements

### 2.1 Functional Requirements

#### 2.1.1 In Scope

The HIPS-UI Web product will be extended with the following capabilities as part of the implementation of the PCEHR Web Viewer feature provided by the HIPS NPDR project.

ID	Description	Iteration
FR-1	<b>"PCEHR Web Viewer – List &amp; View all Clinical Documents"</b> Provided as a menu item within the existing HIPS-UI Web interface. Consists of the capabilities listed in FR-1.*	4A
FR-1.1	<b>"Patient List"</b> Accessed from the "PCEHR View" menu item. Provides a searchable list of patients with an advertised PCEHR who are currently resident in hospital. Allows selection of a patient to view the documents and prescription dispense view available through their PCEHR via the "Patient Summary" screen. Refer to <a href="#">Patient List</a> .	4A
FR-1.2	<b>"Patient Summary"</b> Accessed from the "Patient List" screen when a patient is selected. Provides access to "Document List" (FR-1.3) and "Prescription Dispense View" (FR-2.1) as components of the screen and to "Gain Access" (FR-3.2) separately. Refer to <a href="#">Patient Summary</a> .	4D
FR-1.3	<b>"Document List"</b> Available as a component on the "Patient Summary" screen. Provides a searchable list of documents available through the selected patient's PCEHR. Allows selection of a document to view its contents via the "Document View" screen. Refer to <a href="#">Document List</a> .	4A
FR-1.4	<b>"Document View"</b> Accessed from the "Document List" or "Prescription Dispense View" component when a document is selected. Provides a rendered view of the selected document's contents. Refer to <a href="#">Document View</a> .	4A
FR-2	<b>"PCEHR Web Viewer – View Combined Prescriptions &amp; Dispensing"</b> Consists of the capabilities listed in FR-2.*.	4B
FR-2.1	<b>"Prescription Dispense View"</b> Accessed as a component on the "Patient List" screen. Provides a combined view of the prescription and dispense history for the selected patient available via the NPDR. Refer to <a href="#">Prescription Dispense View</a> .	4B
FR-3	<b>"PCEHR Web Viewer – Add CCA Requirements"</b> Consists of the capabilities listed in FR-3.*.	4C



ID	Description	Iteration
FR-3.1	<b>"Security Model"</b> Provides authentication of users accessing the HIPS-UI Web product and authorisation of the features they have access to. In support of NFR-2.1, NFR-2.2 and configurable as per NFR-5.5 ( <a href="#">Non-Functional Requirements</a> ). Refer to <a href="#">Security</a> .	4C
FR-3.2	<b>"PCEHR Access Check &amp; Gain Access"</b> Accessed from the "Patient List" screen when a patient is selected, or explicitly from the "Patient Summary" screen. Checks the current access to the selected patient's PCEHR and if required enables the user to gain access to the selected patient's PCEHR (a) without code; (b) with code; (c) emergency access. In support of NFR-1.1 ( <a href="#">Non-Functional Requirements</a> ). Refer to <a href="#">PCEHR Access Check &amp; Gain Access</a> .	4C
FR-3.3	<b>Compliance</b> Implementation of additional functional and non-functional capabilities to meet CCA requirements for the PCEHR Web Viewer acting as a component of a CIS. In support of NFR-1.1 ( <a href="#">Non-Functional Requirements</a> ). Refer to <a href="#">Support for Compliance Requirements</a> .	4C
FR-3.4	<b>"Error Handling"</b> Provides standard mechanisms for handling of errors encountered within the HIPS-UI Web product. In support of NFR-4.1, NFR-5.3 and configurable as per NFR-5.5 ( <a href="#">Non-Functional Requirements</a> ). Refer to <a href="#">Error Handling</a> .	4C
FR-4	<b>"PCEHR Web Viewer – Feedback &amp; Revision"</b> Incorporation of feedback obtained through previous iterations.	4D

### 2.1.2 Deferred

The following additional capabilities are noted, but will not be provided as part of the HIPS NPDR project:

ID	Description
DFR-1	<b>"Document Age"</b> Provides an indication of document age and via the "Document List" screen.
DFR-2	<b>"Document History"</b> Provides a view of the history associated with a selected document.
DFR-3	<b>"Explicitly Filter Patients by Ward"</b> Extends the filtering provided by the "Patient List" screen to include both hospital and, for a selected hospital, the set of wards in that hospital.
DFR-4	<b>"Recent Documents"</b> Initially loads only "recent documents" on the "Document List" screen, enabling the user to explicitly opt to load additional older documents if required.
DFR-5	<b>"Association between Hospitals or HPI-Os &amp; Roles as part of Security Model"</b> Extends the role-based security model to provide for the association of one or more hospitals or HPI-Os with one or more authorisation roles as part of the security model, for the purposes of authorising access to patient data for a hospital or HPI-O associated with a role the user is a member of.

### 2.1.3 Out of Scope

The following requirements are explicitly noted as being outside of the scope of capabilities to be provided by the PCEHR Web Viewer as part of the HIPS NPDR project:

ID	Description
XFR-1	<p><b>"Patients with a hidden PCEHR"</b></p> <p>The PCEHR Web Viewer will only support the viewing of the PCEHR for patients who have advertised or disclosed their PCEHR. If a patient has elected to prevent healthcare professionals' software from automatically checking and displaying whether he/she has an eHealth record, the PCEHR Web Viewer <b>will not</b> include these patients in its results, unless the patient's disclosure of the existence of a PCEHR has been recorded via the HIPS-Core Disclose PCEHR functionality. The PCEHR Web Viewer <b>will not</b> provide a capability to do a specific search for a hidden PCEHR, and it <b>will not</b> provide a capability to "unhide" a hidden PCEHR.</p>
XFR-2	<p><b>"Patients with Alerts"</b></p> <p>The PCEHR Web Viewer will not list patients with current IHI data quality alerts (notification of an exception or event caused by mismatched or conflicting demographic data), and it is not within the scope of the HIPS NPDR project to display such alerts or to provide capabilities or processes to support the management of such alerts.</p>

## 2.2 Non-Functional Requirements

### 2.2.1 In Scope

The following non-functional requirements apply to the PCEHR Web Viewer to be provided by the HIPS NPDR project. The majority of these requirements will be addressed during Iterations 4C and 4D.

ID	Category	Description	Requirement
NFR-1.1	Compliance	<b>CCA</b>	<p>Compliance with at least mandatory requirements within the following CCA use cases for the PCEHR Web Viewer acting as a component of a CIS:</p> <p><u>CIS Connecting to the PCEHR System</u> [RR-5], [RR-6], [RR-7]</p> <ul style="list-style-type: none"> <li>UC.CIS.002.1: Gain access to PCEHR (with Access Code)</li> <li>UC.CIS.002.2: Gain access to PCEHR (without Access Code)</li> <li>UC.CIS.002.3: Gain access to PCEHR (Emergency Access)</li> <li>UC.CIS.204: Download a Clinical Document</li> <li>UC.CIS.301: Access a View Service</li> </ul> <p><u>CDA Rendering</u> [RR-8], [RR-9], [RR-10], [RR-11]</p> <ul style="list-style-type: none"> <li>CDAR_RS_01: Rendering Systems</li> </ul> <p><u>Prescription and Dispense View Presentation Guide</u> [RR-3], [RR-4]</p> <ul style="list-style-type: none"> <li>2: NPDR Presentation Guide</li> </ul>
NFR-1.2	Compliance	<b>Accessibility</b>	No requirement identified.

ID	Category	Description	Requirement
NFR-2.1	Security	<b>Authentication</b> of users of the feature.	Support for authentication of users via Windows Active Directory credentials. Refer also to XNFR-2.
NFR-2.2	Security	<b>Authorisation</b> of authenticated user access to the feature.	Support for authorisation of authenticated users via membership in Windows Active Directory groups. Refer also to XNFR-2.
NFR-2.3	Security	<b>Auditing</b> of usage of the feature.	No requirement identified. <sup>1</sup>
NFR-2.4	Security	<b>Confidentiality</b> of data in flight.	Support for transport layer security using HTTPS.
NFR-2.5	Security	<b>Confidentiality</b> of data at rest.	No requirement identified. <sup>2</sup>
NFR-2.6	Security	<b>Resource access</b> to remote resources.	As required by web services provided by HIPS-Core <sup>3</sup> .
NFR-3.1	Performance	<b>Response time</b>	No requirement identified.
NFR-3.2	Performance	<b>Caching</b>	Limited server-side caching of data retrieved from remote resources such as the PCEHR, with a configurable absolute expiration for cached data.  To the extent possible, prevent client-side caching of data. <sup>4</sup>
NFR-4.1	Reliability	<b>Error handling</b>	Where practical, capability or function specific handling of error conditions.  Provision of a “default” mechanism to handle all errors that are not explicitly handled elsewhere.  All error handling to include: (a) Informing the user of the error condition (avoiding disclosure of sensitive information) and (b) other actions as required in support of NFR-5.3. Refer also to XNFR-3.
NFR-5.1	Serviceability	<b>Maintainability</b>	No requirement identified.
NFR-5.2	Serviceability	<b>Manageability</b>	No requirement identified.
NFR-5.3	Serviceability	<b>Diagnosability</b> (error reporting, logging, monitoring & notification)	Logging of detailed information pertaining to error conditions to a configurable destination such as the Windows Application Event Log. Refer also to XNFR-3, XNFR-4.
NFR-5.4	Serviceability	<b>Supportability</b> (technical training & documentation)	Provision of implementation documentation (release notes, deployment guides).
NFR-5.5	Serviceability	<b>Configurability</b>	Support for configuring implementation or environment specific settings outside of application code, for example through a configuration file or database.
NFR-5.6	Serviceability	<b>Supportability</b> (end-user training & documentation)	No requirement identified.

<sup>1</sup> It is assumed that all operation-specific auditing requirements are implemented by HIPS-Core.

<sup>2</sup> Eg, temporary files unpacked on server as part of document rendering.

<sup>3</sup> Authentication to service endpoint using service credentials. Provision of consumer identity within body of request to web service.

<sup>4</sup> For example, by setting “no cache” headers to be respected by web browser clients.

ID	Category	Description	Requirement
NFR-6.1	Interoperability	<b>Resource access</b>	Interaction with SOAP 1.2 based web services provided by HIPS-Core.
NFR-7.1	Technology	<b>Device compatibility</b>	Client: PC, laptop, tablet running a supported operating system natively Server: Server or virtual machine running a supported operating system natively
NFR-7.2	Technology	<b>Operating system compatibility</b>	Client: Windows 7, Windows 8 Server: Windows Server 2008 R2
NFR-7.3	Technology	<b>Web browser compatibility</b>	Microsoft Internet Explorer 10+ Google Chrome 30+ Mozilla Firefox 24+
NFR-7.4	Technology	<b>Technology platform</b>	Alignment with technology platform employed by existing HIPS-Core and HIPS-UI products, particularly: Microsoft .NET Framework 4.0+ SQL Server 2008 R2
NFR-8.1	Scalability	<b>Data volume</b>	Up to 600 patients within a hospital <sup>5</sup>
NFR-8.2	Scalability	<b>Concurrent users</b>	No requirement identified.

## 2.2.2 Out of Scope

The following non-functional requirements are explicitly noted as being outside of the scope of the HIPS NPDR project:

ID	Description
XNFR-1	<p><b>Security Assessment &amp; Compliance</b></p> <p>While design and development of the PCEHR Web Viewer will where practical and achievable incorporate consideration of security best practices, the HIPS NDPR project will not include any explicit security assessment or compliance measures, other than those addressed as part of CCA compliance NFR-1.1.</p> <p>It is noted for the purposes of any such measures to be conducted in the future that in particular the following guidance may be relevant:</p> <ul style="list-style-type: none"> <li>National eHealth Security and Access Framework (NESAF)</li> <li>OWASP Top 10 - 2013</li> </ul>
XNFR-2	<p><b>Additional Authentication &amp; Authorisation Mechanisms</b></p> <p>The PCEHR Web Viewer will only support integrated Windows Active Directory based authentication and authorisation as described by NFR-2.1 and NFR-2.2. Additional authentication and authorisation mechanisms may potentially be able to be supported, but will not be catered for, implemented or tested as part of the HIPS NPDR project. This includes but is not limited to forms-based authentication where user authentication or authorisation information is stored outside of Active Directory in another repository such as a database.</p>
XNFR-3	<p><b>Removal of Sensitive Data from Information Logged in Error Conditions</b></p> <p>As a component of error handling NFR-4.1 and diagnosability NFR-5.3, it is assumed that potentially sensitive data will not be returned from HIPS-Core services in the case of error conditions. As such, it will be assumed that the removal of sensitive data from information logged by the HIPS-UI Web product as a result of any error handling mechanism implemented will not be required.</p>

<sup>5</sup> Based on sample sizes provided for RAH and FMC.

ID	Description
XNFR-4	<b>Error Reporting, Monitoring &amp; Notification</b> As a component of diagnosability NFR-5.3, it is assumed that error reporting, monitoring and notification will be fulfilled by other tools based on data logged, and as such the implementation of tools or processes in support of these are outside of the scope of the HIPS NPDR project.

### 3. Design

#### 3.1 Support for Compliance Requirements

##### 3.1.1 Introduction

The following sections expand upon the compliance requirements listed in NFR-1.1, and provide details of the support provided for each compliance requirement by the PCEHR Web Viewer feature through the HIPS NPDR project.

The set of conformance requirements for each use case are listed in descending order of "Priority", from Mandatory to Conditional to Recommended or Optional requirements.

The "Support" column in the table takes one of the following values:

- None: No support for the requirement is provided by the PCEHR Web Viewer, for the reasons stated in the "Notes" column.
- Partial: Only partial support for the requirement is provided by the PCEHR Web Viewer, as described in the "Notes" column.
- Direct: Full support for the requirement is provided by the PCEHR Web Viewer, with implementation notes placed in the "Notes" column.
- Indirect: Support for the requirement is provided by another component (such as a NEHTA stylesheet or HIPS-Core services), to the extent and as described in the "Notes" column.

The "Iteration" column provides an indication of the project iteration within which the conformance requirement will be addressed. If the cell is coloured **red**, it indicates that addressing the requirement is still outstanding. Such cells should be revisited once the requirement has been addressed.

##### 3.1.2 CIS Connecting to the PCEHR System

**Related resources:** [RR-5], [RR-6], [RR-7]

Use Case		Conformance Requirement			PCEHR Web Viewer Support		
ID	Name	ID	Title	Priority	Support	Notes	Iteration
UC.CIS.002.1	Gain access to PCEHR (with Access Code)	017836	Preventing healthcare provider access codes from being cached	Mandatory	Direct & Indirect	HIPS-UI Web components do not cache provider access codes entered as described in <a href="#">PCEHR Access Check &amp; Gain Access</a> . HIPS-Core services support this requirement.	4C

Use Case		Conformance Requirement			PCEHR Web Viewer Support		
ID	Name	ID	Title	Priority	Support	Notes	Iteration
		017941	Handling errors received from the PCEHR System	Mandatory	Direct & Indirect	HIPS-UI Web components support this requirement as described in <a href="#">Error Handling</a> . HIPS-Core services support this requirement.	4C
		019048	Ability to submit provider access consent codes (PACC or PACCX)	Mandatory	Direct & Indirect	HIPS-UI Web components support this requirement as described in <a href="#">PCEHR Access Check &amp; Gain Access</a> . HIPS-Core services support this requirement.	4C
		019100	Use of a valid Individual Healthcare Identifier	Mandatory	Indirect	HIPS-Core services support this requirement.	-
		019378	Auditing capability	Recommended	Indirect	HIPS-Core services support this requirement.	-
		017941	Handling errors received from the PCEHR System	Mandatory	Direct & Indirect	HIPS-UI Web components support this requirement as described in <a href="#">Error Handling</a> . HIPS-Core services support this requirement.	4C
UC.CIS.002.2	Gain access to PCEHR (without Access Code)	019100	Use of a valid Individual Healthcare Identifier	Mandatory	Indirect	HIPS-Core services support this requirement.	-
UC.CIS.002.3	Gain access to PCEHR (Emergency Access)	017941	Handling errors received from the PCEHR System	Mandatory	Direct & Indirect	HIPS-UI Web components support this requirement as described in <a href="#">Error Handling</a> . HIPS-Core services support this requirement.	4C
		019116	Conditions of emergency access	Conditional	Direct	HIPS-UI Web components support this requirement as described in <a href="#">PCEHR Access Check &amp; Gain Access</a> .	4C
UC.CIS.204	Download a Clinical Document	018634	Validating the integrity of clinical documents downloaded from the PCEHR System	Mandatory	Indirect	HIPS-Core services support this requirement.	-
		019041	Ability to save or print clinical documents from the PCEHR System	Mandatory	Direct	HIPS-UI Web components support this requirement through the "Print" capability provided on the <a href="#">Document View</a> screen. HIPS-UI Web components do not support saving documents.	4C
		019100	Use of a valid Individual Healthcare Identifier	Mandatory	Indirect	HIPS-Core services support this requirement.	-

Use Case		Conformance Requirement			PCEHR Web Viewer Support		
ID	Name	ID	Title	Priority	Support	Notes	Iteration
		018721	Identifying clinical documents downloaded from the PCEHR System	Conditional	Direct	For the purposes of interpretation of this requirement, the in-memory caching of documents has been deemed by NEHTA to constitute "storage", and as a consequence rendering this requirement mandatory.  HIPS-UI Web components support this requirement by displaying the date and time a document has been downloaded from the PCEHR System on the <a href="#">Document View</a> screen. <sup>6</sup>	4C
		019108	Ability to retrieve a list of clinical documents and a list of historical versions of a document	Recommended	Partial	HIPS-UI Web components only support retrieving a list of clinical documents, not a list of historical versions of a document, as described in <a href="#">Document List</a> .	4A
		019118	Sort and filter lists of clinical documents from the PCEHR System	Recommended	Direct	HIPS-UI Web components support this requirement through the search and sort capabilities of the <a href="#">Document List</a> component.	4A
		019119	Patient demographic information in downloaded clinical documents versus local records	Recommended	Direct	HIPS-UI Web components support this requirement as described in <a href="#">Document View</a> .	4A
		019378	Auditing capability	Recommended	Indirect	HIPS-Core services support this requirement.	-
UC.CIS.301	Access a View Service	018634	Validating the integrity of clinical documents downloaded as part of a view from the PCEHR System	Mandatory	Indirect	HIPS-Core services support this requirement.	-
		019041	Ability to save or print clinical documents downloaded from the PCEHR System	Mandatory	Direct	HIPS-UI Web components support this requirement through the "Print" capability provided by the <a href="#">Prescription Dispense View</a> component of the "Patient Summary" screen. HIPS-UI Web components do not support saving documents.	4D
		019100	Use of a valid Individual Healthcare Identifier	Mandatory	Indirect	HIPS-Core services support this requirement.	-

<sup>6</sup> Refer response from NEHTA reference 5698 in email dated 30/01/2014 13:56.



Use Case		Conformance Requirement			PCEHR Web Viewer Support		
ID	Name	ID	Title	Priority	Support	Notes	Iteration
		018721	Identifying clinical documents downloaded as part of a view from the PCEHR System	Conditional	Direct	For the purposes of interpretation of this requirement, the in-memory caching of documents has been deemed by NEHTA to constitute "storage", and as a consequence rendering this requirement mandatory.  HIPS-UI Web components support this requirement by displaying the date and time a document has been downloaded from the PCEHR System on the <a href="#">Document View</a> screen. <sup>7</sup>	4C
		019119	Patient demographic information in downloaded clinical documents versus local records	Recommended	Direct	HIPS-UI Web Components support this requirement as described in <a href="#">Prescription Dispense View</a> .	4A
		019378	Auditing capability	Recommended	Indirect	HIPS-Core services support this requirement.	-

<sup>7</sup> Refer response from NEHTA reference 5698 in email dated 30/01/2014 13:56.

### 3.1.3 CDA Rendering

**Related resources:** [RR-8], [RR-9], [RR-10], [RR-11]

With the exception of those conformance requirements explicitly listed in this section, all other conformance requirements associated with the CDA Rendering conformance test specification are assumed to be supported by the applicable NEHTA-provided stylesheet referenced in [RR-11], to the extent described in the “readme” file contained as part of [RR-11].<sup>8</sup>

Use Case		Conformance Requirement			PCEHR Web Viewer Support		
ID	Name	ID	Title	Priority	Support	Notes	Iteration
CDAR_RS_01	Rendering systems	CDA-RS 40	<p>If the Rendering System supports printing:</p> <p>(a) The Banner SHALL be printed at the top of each resulting page without any loss of data.</p> <p>(b) The Details SHALL be printed without any loss of data.</p> <p>(c) When printing a document, every page SHOULD include a “Page N of T” marker, to allow document integrity to be easily assessed.</p>	Mandatory	Partial	<p>As per NEHTA clarifications, HIPS-UI Web components will not provide any direct capability within the PCEHR Web Viewer itself for all of these requirements as behaviour depends on web browser configuration.</p> <p>However the project will include a recommendation as part of the documentation that web browsers be appropriately configured to meet this requirement.</p> <p>HIPS-UI Web components do facilitate these requirements (when browsers are appropriately configured) through the “Print” capability provided on the <a href="#">Document View</a> screen with the caveats and clarifications mentioned below</p> <p>(a) This requirement has been clarified by NEHTA to indicate that the page title should be repeated on each page and printed in a particular format. Due to technical limitations it is understood by NEHTA that the title may be truncated in certain scenarios, and the format has therefore been designed to minimise the impact of this truncation. This format is reflected by the title element of the NEHTA Stylesheet. The printing of the page title on each page depends on user browser configuration.<sup>9</sup></p> <p>(b) The Details and Banner are printed without any loss of data.</p> <p>(c) If the viewing web browser is configured appropriately every page will include a “Page N of T” marker to allow document integrity to be easily assessed.<sup>10</sup></p>	4C

<sup>8</sup> As supported by the following statement in the “readme” file:

*“The NEHTA Stylesheet together with a compliant Web Browser and an XSLT Stylesheet processor software constitutes a Rendering System compliant with the CDA RS.”*

<sup>9</sup> Refer response from NEHTA reference 5698 in email dated 13/01/2014 13:10.

<sup>10</sup> Refer response from NEHTA reference 5698 in email dated 13/01/2014 13:10.

Use Case		Conformance Requirement			PCEHR Web Viewer Support		
ID	Name	ID	Title	Priority	Support	Notes	Iteration
		CDA-RS 60	Rendering Systems SHALL ensure they are able to present HTML, PDF, RTF and Plain Text document attachments. Such attachments are not displayed in-line as part of the narrative, but become visible when the user chooses the appropriate interface option to prompt their display (e.g. an HTML link in a web browser to be selected).	Mandatory	Direct	<p>HIPS-UI Web components support this requirement by displaying document attachments as HTML links to be selected in the <a href="#">Document View</a> screen.</p> <p>Rendering of attachment file types requires appropriate technology to be installed on the viewing web browser (e.g. a PDF Viewer for PDF files).</p> <p>When an attachment HTML link is selected HIPS-UI Web components will provide the attachments to web browsers in a manner that requests they be displayed within the browser if possible (rather than automatically downloading the file). However, rendering behaviour will be at the discretion of web browser and/or system configuration.</p> <p>Support for this requirement was clarified by NEHTA.<sup>11</sup></p>	4A, 4B 4C

<sup>11</sup> Refer response from NEHTA reference 5698 in email dated 03/02/2014 17:45.

Use Case		Conformance Requirement			PCEHR Web Viewer Support		
ID	Name	ID	Title	Priority	Support	Notes	Iteration
		CDA-RS 69	<p>When displaying a CDA document:</p> <p>(a) Rendering Systems SHALL check the CDA Rendering Specification version in the &lt;templateId&gt; header element of the CDA document.</p> <p>(b) Rendering Systems SHALL display a clear warning if they are not compliant with the Rendering Specification version asserted in the CDA document being displayed.</p> <p>(c) Rendering Systems SHALL require users to acknowledge the warning before viewing the content.</p>	Mandatory	Direct	<p>HIPS-UI Web components support this requirement by displaying the warning produced by the NEHTA Stylesheet on the <a href="#">Document View</a> screen when the CDA document being displayed is not compliant with the Rendering Specification version.</p> <p>When this warning is detected, the HIPS-UI Web components will display an additional warning banner which must be acknowledged by clicking a button in order to view the document (c). This capability is implemented explicitly as it has been removed from the NEHTA stylesheet.<sup>12</sup></p>	4C

In addition to those requirements listed in the preceding table, the following requirements have been explicitly clarified with NEHTA and confirmed as being supported by the NEHTA stylesheet:<sup>13</sup>

- CDAR\_RS\_008, CDAR\_RS\_021, CDAR\_RS\_059-1, CDAR\_RS\_059-3

The following additional operational requirements are listed within the “readme” file contained as part of [RR-11]. For the purposes of the contents of the table below, those operational requirements that include a statement phrased as “SHALL” are interpreted as Mandatory requirements, consistent with the interpretation of such in other NEHTA specifications.

In the absence of explicitly defined use case or conformance reference identifiers, operational requirements have been assigned an identifier specific to this document, and are listed simply as individual requirements statements derived from each “bullet point” in the “readme” file.

The operational requirements are introduced in the “readme” file as follows:

<sup>12</sup> Refer response from NEHTA reference 5698 in email dated 13/01/2014 13:10.

<sup>13</sup> Refer response from NEHTA reference 5698 in email dated 30/01/2014 13:56.

## Operational Requirements

=====

*When using the NEHTA Stylesheet as part of a CDA RS compliant Rendering System, the following operational requirements apply:*

Operational Requirement			PCEHR Web Viewer Support		
ID	Statement	Priority	Support	Notes	Iteration
CDAR_XSLT_OR_1	The NEHTA Stylesheet SHALL be executed using an XSLT 1.0 compatible processor.	Mandatory	Direct	HIPS-UI Web components support this requirement by employing the .NET <i>XslCompiledTransform</i> class, which provides an XSLT processor that supports the XSLT 1.0 syntax, as described in the "Remarks" section of <a href="http://msdn.microsoft.com/en-us/library/system.xml.xsl.xslcompiledtransform(v=vs.110).aspx">http://msdn.microsoft.com/en-us/library/system.xml.xsl.xslcompiledtransform(v=vs.110).aspx</a> .	4A, 4B
CDAR_XSLT_OR_2	The input CDA Document SHALL be conformant with existing NEHTA CDA Implementation Guides and the CDA Rendering Specification.	Mandatory	Indirect	It is assumed that clinical systems uploading documents to the PCEHR system are assessed for compliance to CDA Implementation Guides and the authoring requirements in the CDA Rendering Specification in the CCA process prior to gaining authorisation to access the PCEHR system. Also, the PCEHR system uses the Schematron rules embedded in the referenced template package to verify the conformance of each uploaded document with the relevant CDA Implementation Guide.	-
CDAR_XSLT_OR_3	The output HTML document of the NEHTA Stylesheet SHALL be displayed using an HTML 4.01, JavaScript 1.5 and CSS 2.1 compatible rendering engine or software which employs such a rendering engine (e.g. a web browser).	Mandatory	Direct	HIPS-UI Web components support this requirement by specifying a minimum web browser compatibility level that provides support exceeding the specified HTML, JavaScript and CSS levels through NFR-7.3.	4A, 4B 4C
CDAR_XSLT_OR_4	Rendering Systems SHALL ensure the display they intend to view the HTML document produced by the NEHTA Stylesheet has a resolution of at least 1024x768 pixels. Note that this does not exclude smaller screen sizes (e.g. smart phones and tablets) if they allow scrolling the display to view the entire document.	Mandatory	Direct	HIPS-UI Web components support this requirement by scrolling where required and specifying minimum browser requirements.	4A, 4B

Operational Requirement			PCEHR Web Viewer Support		
ID	Statement	Priority	Support	Notes	Iteration
CDAR_XSLT_OR_5	Rendering Systems SHALL provide appropriate input devices to allow a user to scroll through the entire document contents and view any PDF, RTF or text attachments.	Mandatory	Partial	HIPS-UI Web components support this requirement by scrolling where required and providing links (as part of the rendering provided through the NEHTA stylesheet) to open attachments.  HIPS-UI Web cannot guarantee that appropriate software is installed on the end-user device from which the PCEHR Web Viewer is being accessed in order to correctly open and display PDF, RTF and text attachments. The project will include a recommendation as part of the documentation delivered with the PCEHR Web Viewer that such appropriate software be installed on end-user devices if possible.	4A, 4B 4C
CDAR_XSLT_OR_6	The NEHTA Stylesheet execution does check the CDA Rendering Implementation Guide version if present in the CDA document. If a newer version of this guide is asserted in the CDA document, the Banner in the produced HTML document will alert the user and require input to display the rest of the document.	-	-	Not stated as a requirement, assumed informational.	-
CDAR_XSLT_OR_7	The NEHTA Stylesheet presents the contents of the Banner as the document rendering view title as found in the title in the header of the produced HTML document.	-	-	Not stated as a requirement, assumed informational.	-
CDAR_XSLT_OR_8	Rendering Systems SHALL check the versions prior to executing the NEHTA Stylesheet.	Mandatory	Direct	As per "Notes" for CDA-RS 69.	4C
CDAR_XSLT_OR_9	Implementers are advised that current web browsers may allow users to define settings which might override HTML stylesheet elements. As this could potentially lead to clinically relevant information being rendered outside viewable screen space, it is suggested that appropriate measures are taken prevent this from occurring.	Recommended	None	As this requirement is stated in the manner of a recommendation, no support will be provided at this time.	-
CDAR_XSLT_OR_10	Rendering Systems using the NEHTA Stylesheet SHALL NOT allow users to override the presentation and style contained in the HTML produced by the NEHTA Stylesheet.	Mandatory	Partial	HIPS-UI Web components will not provide any direct capability within the PCEHR Web Viewer itself that would allow a user to override the presentation and style contained in the HTML produced.  HIPS-UI Web components however cannot prevent a user from utilising "developer tools" provided as part of a web browser to override the presentation and style contained in the HTML produced. The project will include a recommendation as part of the documentation delivered with the PCEHR Web Viewer that such web browser capabilities be limited if possible.	4C

Operational Requirement			PCEHR Web Viewer Support		
ID	Statement	Priority	Support	Notes	Iteration
CDAR_XSLT_OR_11	Rendering Systems using the NEHTA Stylesheet SHALL ensure that the title of the resulting HTML document produced is printed at the top of every page when printed.	Mandatory	Partial	HIPS-UI Web components will not provide any direct capability within the PCEHR Web Viewer itself as this behaviour depends on web browser configuration.  However the project will include a recommendation as part of the documentation that web browsers be appropriately configured to meet this requirement.	4C
CDAR_XSLT_OR_12	Rendering Systems using the NEHTA Stylesheet SHALL ensure that the "Page N of T" marker is printed at the bottom of every page when the HTML document is printed.	Mandatory	Partial	HIPS-UI Web components will not provide any direct capability within the PCEHR Web Viewer itself as this behaviour depends on web browser configuration.  However the project will include a recommendation as part of the documentation that web browsers be appropriately configured to meet this requirement.	4C
CDAR_XSLT_OR_13	Rendering Systems using the NEHTA Stylesheet SHALL ensure that background colours and images are printed when printing the output of the NEHTA Stylesheet.	Mandatory	Partial	HIPS-UI Web components will not provide any direct capability within the PCEHR Web Viewer itself as this behaviour depends on web browser configuration.  However the project will include a recommendation as part of the documentation that web browsers be appropriately configured to meet this requirement.	4C
CDAR_XSLT_OR_14	Rendering Systems using the NEHTA Stylesheet SHALL ensure that the view is shrunk to fit the page when printing the output of the NEHTA Stylesheet.	Mandatory	Partial	HIPS-UI Web components will not provide any direct capability within the PCEHR Web Viewer itself as this behaviour depends on web browser configuration.  However the project will include a recommendation as part of the documentation that web browsers be appropriately configured to meet this requirement.	4C
CDAR_XSLT_OR_15	The style sheet version can be displayed at the bottom of the document if the styleSheetVersionDisplay is set to true. If any modification is made to the style sheet, the version should be changed to reflect this and the variable VERSION_NOTE should be changed to indicate that the style sheet is now a "vendor" version as opposed to the "nehta" one. This should never default to true in a production environment.	-	-	Not stated as a requirement, assumed informational.	-

### 3.1.4 Prescription and Dispense View Presentation Guide

**Related resources:** [RR-3], [RR-4]

The NEHTA PCEHR Prescription and Dispense View Presentation Guide indicates a series of view presentation requirements to be met or considered in the presentation of a Prescription and Dispense View.

As stated in the NEHTA Prescription and Dispense View Presentation Guide Conformance Test Data document, if using the NEHTA-provided XSLT stylesheet, a number of conformance requirements / test cases are automatically supported & passed. These are PDV\_RS\_:

- 005, 006, 007, 070, 009, 010, 012, 013, 014, 015-01, 015-02, 016, 017-01, 017-02, 018-01, 018-02, 019, 020, 021-01, 022, 024, 025-01, 028, 029-01, 030, 072, 037, 038, 039, 041, 042, 045, 046, 047, 048-01, 048-02, 049-01, 049-02, 050-01, 050-02, 052, 053-01, 053-02, 054-01, 054-02, 056-01, 056-02, 057-01, 057-02, 059-01, 059-02, 060-01, 060-02

The remaining conformance requirements either may be implemented by the stylesheet but must still be explicitly tested, or if applicable and relevant must be implemented by the implementer. The following additional conformance requirements / test cases are assumed to be supported by the stylesheet:

- 004, 011, 023, 026, 027, 040, 043, 044, 051, 055, 058, 061

The following table lists the remaining conformance requirements and their level of support by the PCEHR Web Viewer:

Operational Requirement			PCEHR Web Viewer Support		
ID	Statement	Priority	Support	Notes	Iteration
PDV_RS_000	If the PCEHR NPDR View Style Sheet is implemented by the system and has not been modified, the integrity of the Style Sheet shall be confirmed.	Conditional	N/A	Executed as part of test execution to verify stylesheet has not been modified, in order to automatically pass those conformance tests for requirements supported by the NEHTA stylesheet.	4C
View-PD1	The PD View should have a prominent title.	Recommended	Direct	HIPS-UI Web Components support this requirement as described in <a href="#">Prescription Dispense View</a> .	4B
View-PD2	The PD View <b>shall</b> display the title 'Prescription and Dispense View'.	Mandatory	Direct	HIPS-UI Web Components support this requirement as described in <a href="#">Prescription Dispense View</a> .	4B
View-PD3	The PD View <b>should</b> have a Print button integrated into the <b>PD3</b> Header.	Recommended	None	As this requirement is stated as a recommendation, no support will be provided at this time.	-
View-PD8	All fully specified dates <b>should</b> be displayed in the format DD-Mmm-YYYY e.g. 14-Aug-2011.	Recommended	None	Filter dates use dd/mm/yyyy for simplified user entry.	-
View-PD12	The Date filter <b>shall</b> retrieve and display search items.	Mandatory	Direct	HIPS-UI Web Components support this requirement as described in <a href="#">Prescription Dispense View</a> .	4B



Operational Requirement			PCEHR Web Viewer Support		
ID	Statement	Priority	Support	Notes	Iteration
View-PD21	The Group By menu <b>shall</b> display 'Generic Name' to signify Group By Type has been applied.	Mandatory	Direct	HIPS-UI Web Components support this requirement as described in <a href="#">Prescription Dispense View.</a>	4B
View-PD25	The Group By menu <b>shall</b> display 'PBS Item Code' to signify Group By Type has been applied.	Mandatory	Direct	HIPS-UI Web Components support this requirement as described in <a href="#">Prescription Dispense View.</a>	4B
View-PD29	The Group By menu <b>shall</b> display 'Brand Name' to signify Group By Type has been applied.	Mandatory	Direct	HIPS-UI Web Components support this requirement as described in <a href="#">Prescription Dispense View.</a>	4B
View-PD31	If the therapeutic good identification is a generic name (i.e. where the therapeutic good identification is the same as therapeutic good generic name) then The View should display Brand Name summary line item as "unavailable".	Optional			
View-PD32	The whole view <b>should</b> scroll vertically.	Recommended	Direct	HIPS-UI Web Components support this requirement as described in <a href="#">Prescription Dispense View.</a>	4B
View-PD33	The PD View <b>should</b> vertically scroll independently of the Framework (e.g. CIS system header, navigation pane, menu bar, ribbons and footer).	Recommended	None	HIPS UI Web Components do not support this recommended requirement as user experience would be diminished with nested scrollbars.	-
View-PD34	The PD View <b>shall not</b> horizontally scroll in the Framework	Mandatory	Direct	HIPS-UI Web Components support this requirement as described in <a href="#">Prescription Dispense View.</a>	4B
View-PD35	The prescription components in The PD View area <b>shall</b> be displayed as collapsed rows as default.	Mandatory	Direct	HIPS-UI Web Components support this requirement as described in <a href="#">Prescription Dispense View.</a>	4B
View-PD36	When the mouse cursor is held over the summary line, then the summary line <b>shall</b> be displayed in red text or a text colour that provides colour differentiation according to the implementer's accessibility standards. <i>Note: this conformance point applies to the summary line for each of the Group by options.</i>	Mandatory	Direct	HIPS-UI Web Components support this requirement as described in <a href="#">Prescription Dispense View.</a>	4B
View-PD48	The components of the expanded summary line item <b>should</b> be presented when the user clicks on the collapsed prescription summary line.	Recommended	Direct	HIPS-UI Web Components support this requirement as described in <a href="#">Prescription Dispense View.</a>	4B

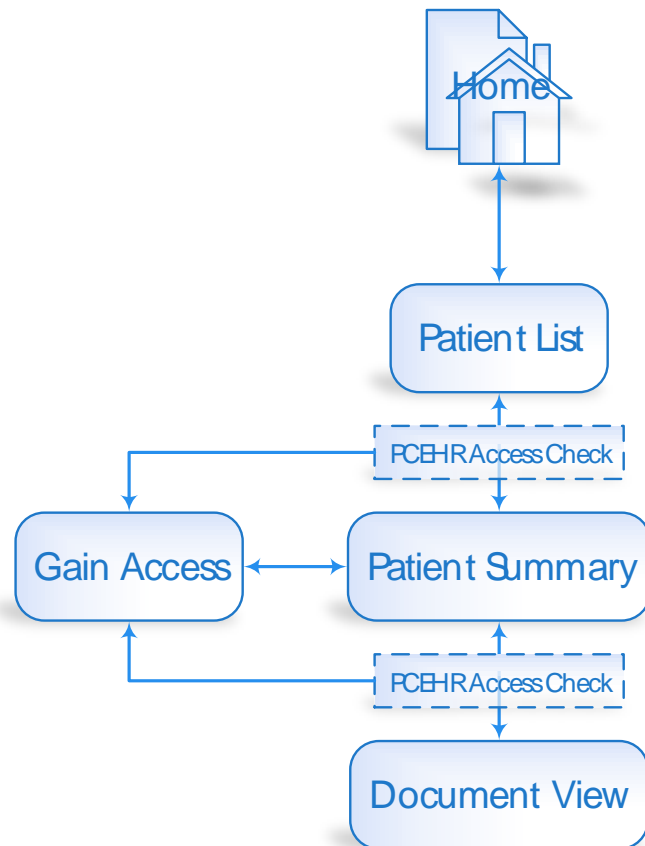
Operational Requirement			PCEHR Web Viewer Support		
ID	Statement	Priority	Support	Notes	Iteration
View-PD52	The user <b>should</b> be able to expand multiple prescription components by clicking the mouse button. The expanded summary blocks will be displayed in The PD View.	Recommended	Direct	HIPS-UI Web Components support this requirement as described in <a href="#">Prescription Dispense View.</a>	4B
View-PD62	When a user clicks a Prescription document line item, the Prescription CDA document <b>shall</b> be retrieved from the PCEHR system, rendered, and displayed in The PD View.	Mandatory	Direct	Implementation loads document using standard hyperlink and loads within the web browser viewer.	4B
View-PD63	When a user clicks a Dispense document line item, the Dispense CDA document <b>shall</b> be retrieved from the PCEHR system, rendered, and displayed in The PD View.	Mandatory	Direct	Implementation loads document using standard hyperlink and loads within the web browser viewer.	4B
View-PD64	The PD View <b>shall</b> contain the following components: Filter by Date Range	Mandatory	Direct	HIPS-UI Web Components support this requirement as described in <a href="#">Prescription Dispense View.</a>	4B
View-PD65	The PD View <b>shall</b> contain the following components: <ul style="list-style-type: none"> <li>• Group by filter:</li> <li>• Prescription</li> <li>• Generic Name</li> <li>• PBS Item Code</li> <li>• Brand Name</li> </ul>	Mandatory	Direct	HIPS-UI Web Components support this requirement as described in <a href="#">Prescription Dispense View.</a>	4B
View-PD67	The Generic Name components in The PD View area <b>shall</b> be displayed as collapsed rows as default.	Mandatory	Direct	HIPS-UI Web Components support this requirement as described in <a href="#">Prescription Dispense View.</a>	4B
View-PD68	The PBS item code components in The PD View area <b>shall</b> be displayed as collapsed rows as default.	Mandatory	Direct	HIPS-UI Web Components support this requirement as described in <a href="#">Prescription Dispense View.</a>	4B
View-PD69	The Brand Name components in The PD View area <b>shall</b> be displayed as collapsed rows as default.	Mandatory	Direct	HIPS-UI Web Components support this requirement as described in <a href="#">Prescription Dispense View.</a>	4B

Operational Requirement			PCEHR Web Viewer Support		
ID	Statement	Priority	Support	Notes	Iteration
View-PD74	<p>When the mouse cursor is held over the summary line, then the background of the summary line <b>should</b> be highlighted.</p> <p><i>Note:</i> this conformance point applies to the summary line for each of the Group by options.</p>	Recommended	None	HIPS UI Web Components do not support this requirement. However, behaviour follows NEHTA stylesheet which changes text colour and mouse pointer on hover instead of background colour.	4B

## 3.2 Functional Design

### 3.2.1 Navigation Workflow

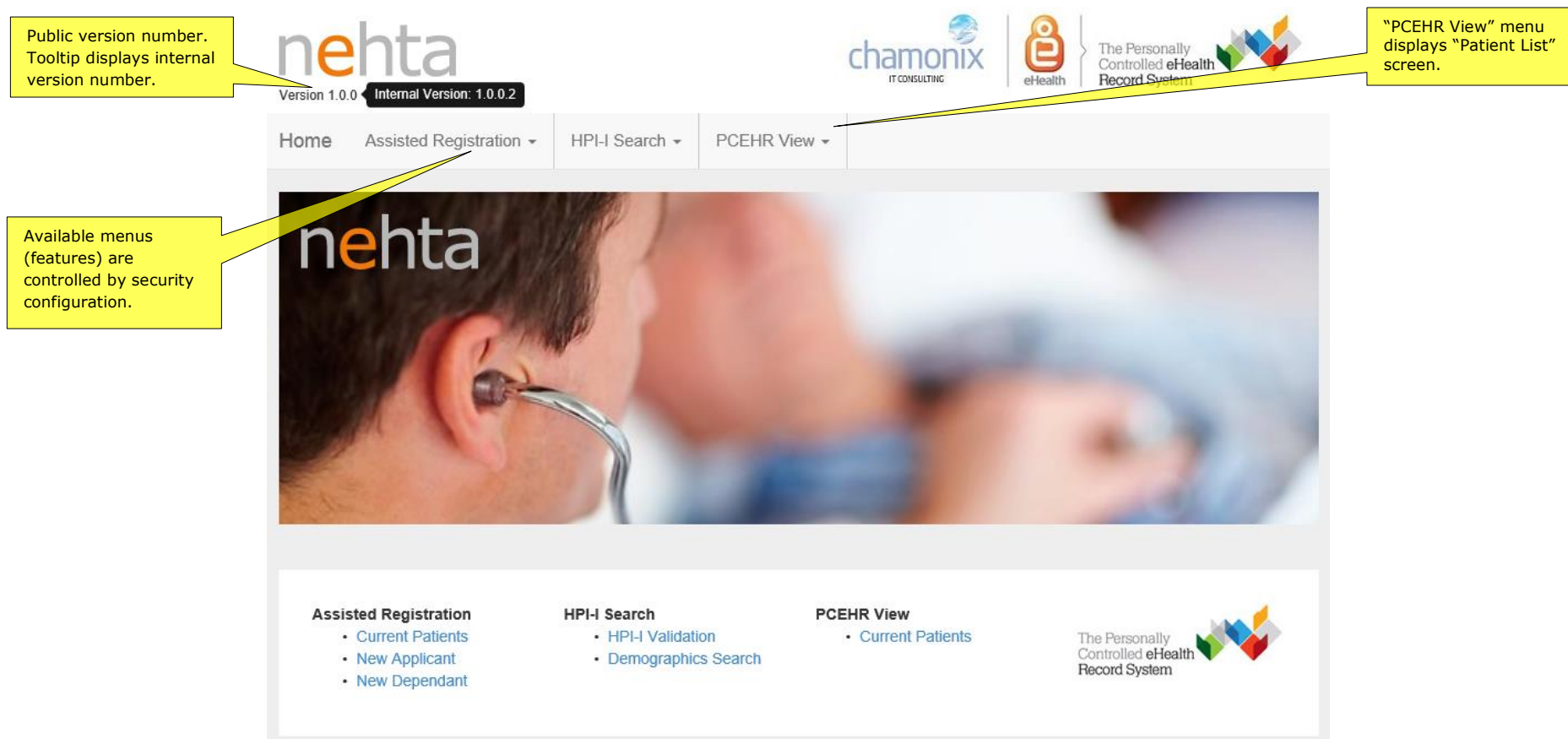
The diagram below illustrates the navigation workflow between the screens to be implemented as part of the PCEHR Web Viewer.



Each of these screens is described further in the sections that follow.

### 3.2.2 Home

The “Home” screen is the entry point into the HIPS-UI Web product. It provides a “PCEHR View” menu item to access the PCEHR Web Viewer feature.



### 3.2.3 Patient List

The annotated image below illustrates the functional design for the "Patient List" screen accessed via the "PCEHR Web Viewer" menu item on the "Home" screen.

**Patients at Royal Chamonix Hospital**

**Hospital \***  
Royal Chamonix Hospital

**Search** Type to search...

Name	Date of Birth	Location	MRN	IHI	Actions
DUNCAN, ALEXANDER	05/05/2009	AG::	TEST-CCA_13	8003 6034 5679 9528	
FORDE, FREDERICK	16/01/1928	AG::B3	TEST-PCEHR_22	8003 6045 7063 1431	
GIBBS, GEORGE	20/03/1990	AG::B2	TEST-PCEHR_23	8003 6067 9186 4386	
HOBBS, LUDWIG PHILIP	26/04/1995	W1::B3	RENDERING	8003 6083 3334 5684	
JONES, LILY MAY	30/08/1990	W5::B2	TEST-PCEHR_24	8003 6067 8912 9891	
LAM, BERNARD	13/01/1972	W5::B4	TEST-IHI_4	8003 6081 6670 8479	

Showing 1 to 6 of 6 entries

First Previous 1 Next Last

Filter to select location (hospital).

Filtering based on partial match of contents of any text-based column in results.

"View Patient Summary" button displays "Patient Summary" screen for selected patient.

Results to display: Name, Date of Birth, Location (Ward, Room, Bed), MRN, IHI.

Sorting of results (asc / desc). Default sort: Name, Date of Birth.

Results contain patients who have an advertised PCEHR and are currently resident in hospital. Results **do not** contain patients with any current alerts.

Definition of "current" to allow for configurable window of discharge – eg not discharged, or discharged within x days of current date.

Summary of matching results.

Display format for IHI: nnnn nnnn nnnn nnnn

Paging of results. Page size: 10.

### 3.2.4 PCEHR Access Check & Gain Access

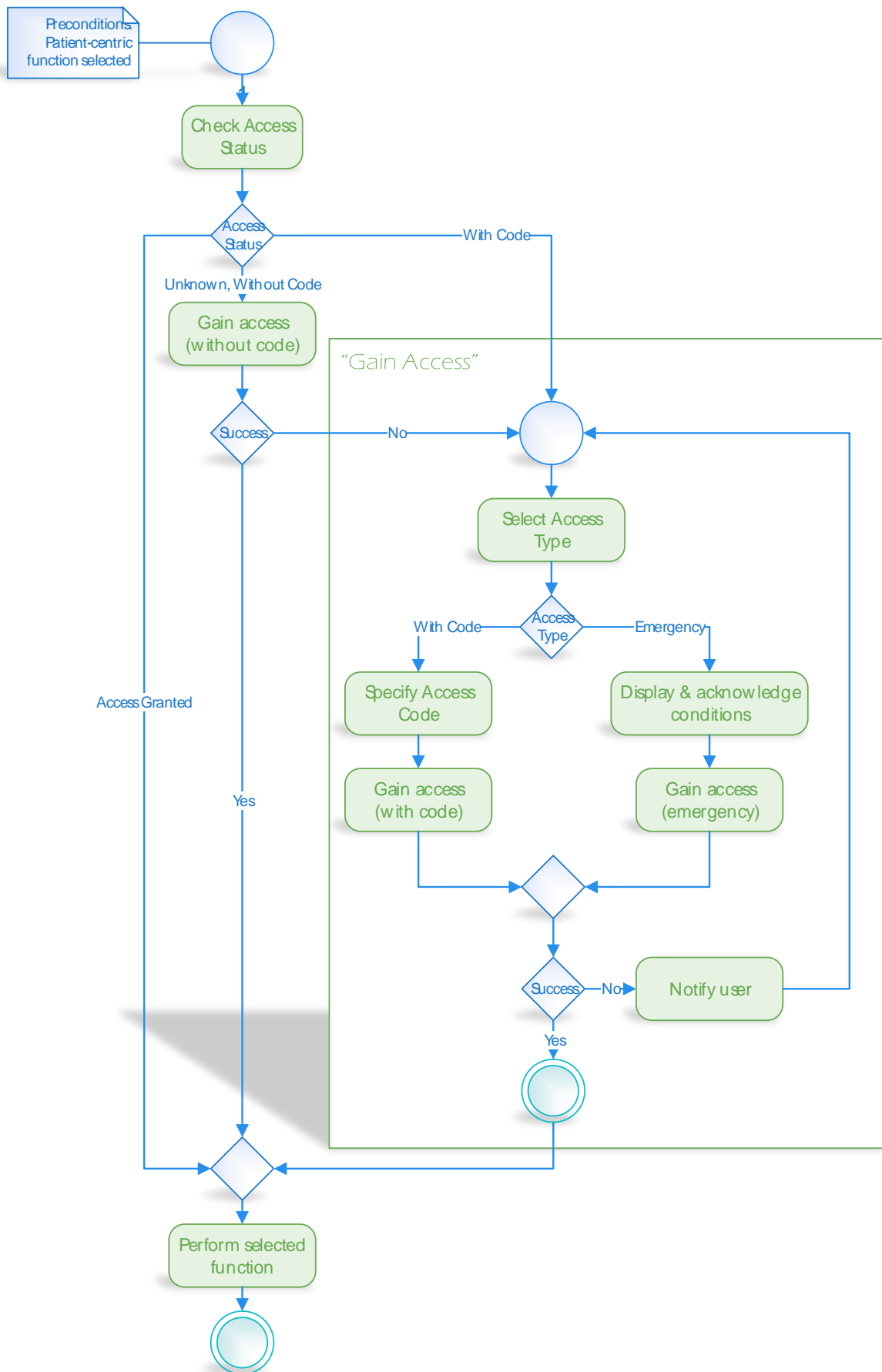
The “PCEHR Access Check & Gain Access” capability enforces only appropriately authorised access to patient information available within the PCEHR. It does this by providing two key components:

- The “PCEHR Access Check” is used to protect any patient-centric function or capability where interaction with the PCEHR for that patient is required. It ensures that a check is made for the current status of access for the current HPI-O (via the selected hospital), and takes steps to prevent a user at that HPI-O from accessing information in a patient’s PCEHR without appropriate access if required.
- The “Gain Access” screen supports a user explicitly requesting access to a patient’s PCEHR, either through the “with code” or “emergency” gain access functions supported by the PCEHR.

**IMPORTANT:**

This capability must support the conformance requirements for UC.CIS.002.\* to the extent described in [CIS Connecting to the PCEHR System](#).

The diagram below illustrates the logical activities required to support the PCEHR Access Check & Gain Access capability:





The key activities and decisions are:

Activity / Decision	Description	Notes
Check Access Status	Checks the status of access for the current HPI-O (via the selected hospital) to a patient's PCEHR.	Via HIPS-Core service PCEHRService.IsPcehrAdvertised
Access Status = "Access Granted"	The HPI-O already has access to the patient's PCEHR, so proceed directly to the originally selected patient-centric function.	
Access Status = "Unknown" or "Without Code"	The access status is either unknown or the HPI-O does not already have access to the patient's PCEHR, but the PCEHR has indicated that access can be gained without code.	In either case, attempt to gain access without code.
Gain access (without code)	Automatically gain access to the patient's PCEHR without a code.	Via HIPS-Core service PCEHRService.GainAccessWithoutCode
Success	For gain access (without code). In the case of success, proceed to the originally selected patient-centric function. In the case of failure, redirect to the "Gain Access" container to attempt to explicitly gain access through another access mechanism.	
Access Status = "With Code"	The HPI-O does not already have access to the patient's PCEHR, but the PCEHR has indicated that access can be gained with a code if required.	
"Gain Access"	Logical container that is executed as part of the overall "PCEHR Access Check" when the patient's access status is "With Code", when access cannot be obtained automatically, or when a user explicitly navigates to the "Gain Access" screen.	
Select Access Type	Provides options for gaining access to the patient's PCEHR using "with code" or "emergency".	
Access Type = "With Code"	The user chooses to enter an access code provided by the patient to gain access to their PCEHR.	Must conform to "CIS Connecting to the PCEHR System" conformance requirement 019048 "Ability to submit provider access consent codes (PACC or PACCX)" (refer to <a href="#">CIS Connecting to the PCEHR System</a> ).
Specify Access Code	The user enters the access code provided by the patient.	
Gain access (with code)	Gain access to the patient's PCEHR using the access code provided by the patient.	Via the HIPS-Core service PCEHRService.GainAccessWithCode
Access Type = "Emergency"	The user chooses to request emergency access to the patient's PCEHR.	Must conform to "CIS Connecting to the PCEHR System" conformance requirement 019116 "Conditions of emergency access" (refer to <a href="#">CIS Connecting to the PCEHR System</a> ).

Activity / Decision	Description	Notes
Display & acknowledge conditions	Display the conditions specified as part of conformance requirement 019116 and ensure they are acknowledged by the user.	
Gain access (emergency)	Gain emergency access to the patient's PCEHR.	Via the HIPS-Core service PCEHRService.GainAccessEmergency
Success	<p>For gain access (with code) or gain access (emergency).</p> <p>In the case of success, proceed to the originally selected patient-centric function.</p> <p>In the case of failure, notify the user of the failure condition then redirect to the start of the "Gain Access" container to allow retry.</p>	

The annotated image below illustrates the functional design for the "Gain Access" screen accessed via the "PCEHR Access Check" function or the "Gain Access" button on the "Patient Summary" screen for a selected patient.

Ability to navigate back to "Patient List" or "Patient Summary" screens

Patients at Royal Chamonix Hospital / Patient Summary for LAM, BERNARD

Gain Access for LAM, BERNARD

A code is required to access the patient's PCEHR.

Access Code

Individuals may set a Record Access Code (RAC) or Limited Document Access Code (LDAC) on their eHealth Record's restricted settings screen.

If your patient has given you an eHealth Record access code, please enter it here:

Access Code

Submit Code

Display reason for being redirected (if relevant). Display error information (not shown).

Explanatory text.

Field for entering access code.

Section for gaining "emergency" access.

Required conditions. Supports "CIS Connecting to the PCEHR System" conformance requirement 019116.

By selecting the Emergency Access option, you are declaring that access to this eHealth Record is necessary to lessen or prevent a serious threat to an individual's life, health or safety or to public health or public safety and your patient's consent cannot be obtained. This will override any access controls set by the individual and will permit access to all active documents for five days. Your Emergency Access will be recorded on the eHealth Record's audit log and the individual may be notified.

I understand and require emergency access to this eHealth record

"I understand..." button acknowledges conditions and attempts to gain "emergency" access.

"Submit Code" button attempts to gain access "with code" using the access code specified.

Upon successfully gaining access, automatically redirect to originally selected function or screen. Upon failure, redisplay screen including error information.

### 3.2.5 Patient Summary

The annotated image below illustrates the functional design for the "Patient Summary" screen accessed via the "View Patient Summary" button on the "Patient List" screen for a selected patient.

Ability to navigate back to "Patient List".

Gain Access button provides access to "Gain Access" screen for selected patient.

Title to be "Patient Summary for <Patient Name>".

Tabs or menus group each document type (and count of documents of that type) available through the patient's PCEHR (asc alpha sort). Selecting an item displays documents of that document type. Refer to the "Document List" component. In addition, the "Prescription & Dispense View" item provides access to the Prescription Dispense View. Refer to the "Prescription Dispense View" component.

"Print" button (not shown) displays separate window containing a printable view. Only available when the "Prescription & Dispense View" tab is selected.

Patients at Royal Chamonix Hospital

Patient Summary for DUNCAN, ALEXANDER

Gain Access

Discharge Summary 8 Shared Health Summary 1 Prescription & Dispense View 69

Search Type to search...

Service Start	Service End	Creation	Organisation	Author	Actions
17/05/2013	29/05/2013	14/06/2013	DHSITESTORGD6	Paul, McKee	
17/05/2013	29/05/2013	14/06/2013	DHSITESTORGD6	Paul, McKee	
17/05/2013	29/05/2013	14/06/2013	DHSITESTORGD9	McKee, Paul	
17/05/2013	29/05/2013	14/06/2013	DHSITESTORGD9	McKee, Paul	
15/05/2014	02/06/2014	24/05/2013	DHSITESTORGD9	Simon, Biber	
31/07/2012	08/08/2012	21/09/2012	DHS5670	Massey, Gordon	
31/07/2012	08/08/2012	20/09/2012	DHSITESTORGD9	Biber, Simon	
31/07/2012	08/08/2012	20/09/2012	DHS5670	Biber, Simon	
Service Start	Service End	Creation	Organisation	Author	Actions

Showing 1 to 8 of 8 entries

First Previous 1 Next Last

### 3.2.6 Document List

The annotated image below illustrates the functional design for the “Document List” component of the “Patient Summary” screen for a selected patient.

Results to display:  
Creation Date,  
Organisation, Author. For  
Discharge Summary also  
display Service Start & End  
Date.

Sorting of results (asc /  
desc). Default sort:  
Creation Date desc.

Results exclude  
Dispense & e-  
Prescription  
documents.

Summary of  
matching  
results.

Q Search

Type to search...

Service Start	Service End	Creation	Organisation	Author	Actions
17/05/2013	29/05/2013	14/06/2013	DHSITESTORGD6	Paul, McKee	
17/05/2013	29/05/2013	14/06/2013	DHSITESTORGD6	Paul, McKee	
17/05/2013	29/05/2013	14/06/2013	DHSITESTORGD9	McKee, Paul	
17/05/2013	29/05/2013	14/06/2013	DHSITESTORGD9	McKee, Paul	
15/05/2014	02/06/2014	24/05/2013	DHSITESTORGD9	Simon, Biber	
31/07/2012	08/08/2012	21/09/2012	DHS5670	Massey, Gordon	
31/07/2012	08/08/2012	20/09/2012	DHSITESTORGD9	Biber, Simon	
31/07/2012	08/08/2012	20/09/2012	DHS5670	Biber, Simon	
Service Start	Service End	Creation	Organisation	Author	Actions

First

Previous

1

Next

Last

Filtering based on partial  
match of contents of any  
text-based column in  
results.

“View Document” button  
displays “Document View”  
screen for selected  
document.

Paging of results  
Page size: 10.

Showing 1 to 8 of 8 entries

### 3.2.7 Prescription Dispense View

**IMPORTANT:**

This capability must support the conformance requirements for UC.CIS.301 to the extent described in [CIS Connecting to the PCEHR System](#).

**IMPORTANT:**

This capability must support the conformance requirements for CDAR\_RS\_01 & CDAR\_XSLT\_OR\_\* to the extent described in [CDA Rendering](#).

**IMPORTANT:**

This capability must support the conformance requirements to the extent described in [Prescription and Dispense View Presentation Guide](#).

The annotated image below illustrates the functional design for the "Prescription Dispense View" component of the "Patient Summary" screen for a specific patient.

"From" date defaults to 24 months ago. "To" date defaults to today.

Require "From" and "To" dates to be selected then click View to retrieve the view for the specified dates.

Date selection allows dd/mm/yyyy text entry, or selection from a Date Picker control. Date Picker control allows the user to pick a year (navigating by decade) then a month and day.

Drop-down selector refreshes the document to group by different field properties supported by NEHTA XSLT. These fields are "Prescription" (Default), "Generic Name", "PBS Item Code", and "Brand Name"

Display warnings (if any) returned from PCEHR.

Display prescription and dispense view contents as HTML generated from XML source using provided NEHTA XSLT & CSS.

Clicking header rows expands and contract nested detail rows.

Document links redirect the browser to view the requested document (require rewriting from NEHTA source).

Ensure nested displayed view does not show any scrollbars (horizontal or vertical).

Display date & time document was downloaded from PCEHR (not shown).

View is printable, refer to "Print" button on "Patient Summary" screen.

**Prescription and Dispense View**  
Grouped by PBS Item Code From 3-Feb-2010 To 6-Dec-2013

**JAKE F BERMAN** DoB 8-Jun-1962 (51y) SEX Male IHI 8003 6080 0000 2519

**START**  
This view is not a complete record of the individual's medicines information.

PBS Item Code  
Records that are unable to be grouped are shown at the end of this list.

PBS Item Code
2845R
3-Nov-2012 Prescribed PERINDOPRIL with INDAPAMIDE HEMIHYDRATE — COVERSYL PLUS 5MG/1.25MG — 5mg/1.25mg — One tablet daily — Supply 30 — Dispense original and 4 repeats
Dispensed PERINDOPRIL with INDAPAMIDE HEMIHYDRATE — COVERSYL PLUS 5MG/1.25MG — 5mg/1.25mg — One tablet daily — Supply 30 — Original dispense

**ADMINISTRATIVE DETAILS**

Patient		Author	
Name	JAKE F BERMAN	Device Name	PCEHR
Sex	Male		
Date of Birth	8-Jun-1962 (51y)		
IHI	8003 6080 0000 2519		
Address	No Fixed Address		

**Clinical Document Details**

Document Type	PCEHR Prescription and Dispense View
Creation Date/Time	6 Dec 2013 15:11+1100
Date/Time Attested	Not Provided
Document ID	2.25.28901529694678024567933857149173559973
Document Version	1

### 3.2.8 Document View

**IMPORTANT:**

This capability must support the conformance requirements for UC.CIS.204 to the extent described in [CIS Connecting to the PCEHR System](#).

**IMPORTANT:**

This capability must support the conformance requirements for CDAR\_RS\_01 & CDAR\_XSLT\_OR\_\* to the extent described in [CDA Rendering](#).

The annotated image below illustrates the functional design for the “Document View” screen accessed via the “View Document” button in the “Document List” component for a selected document, or from the “document” link on the “Prescription Dispense View” component.



**Discharge Summary for DUNCAN, ALEXANDER**

Downloaded from the PCEHR System on 4-Feb-2014 9:58+10:30.

**Discharge Summary (Interim v0.3)**  
29 May 2013

ALEXANDER DUNCAN DoB 5 May 2009 (32y) SEX Male IHI 8003 6034 5679 9528 MRN TEST-CCA\_13

**START OF DOCUMENT**

**Queensland Health**  
Author Paul McKee (Health Professionals nfd)  
Phone (07) 4796 1111  
Discharge Usual Residence/Other  
To

**Department of Health and Human Services**  
Tasmania  
Explore the possibilities

**Event**  
Details of stay

Annotations:

- Display as modal "pop-up" when a document is selected.
- Title to be "<Document Class> for <Patient Name>".
- Display document contents as HTML generated from XML source using provided NEHTA XSLT & CSS.
- "Close" button closes modal pop-up.
- "Print" button displays separate window containing a printable view of the document.
- "Share" button provides URL for "Document View".
- Display embedded images.
- Link to included attachments (not shown).
- Display date & time document was downloaded from PCEHR.
- Display warnings associated with document if returned from PCEHR (not shown). For demographic mismatch warnings, format as (example): "This document and the local patient record have a Different Sex and Different DOB and Different Family Name".

### 3.2.9 Error Handling

**IMPORTANT:**

This capability must support conformance requirement 017941 to the extent described in [CIS Connecting to the PCEHR System](#).


The HIPS-UI Web product addresses error handling through a combined approach of function-specific and general-purpose error handling strategies.

Function-specific strategies focus on errors directly relevant to the execution of a specific action. This includes data validation errors, business rules violations, and connectivity issues with external systems (e.g. HIPS or the PCEHR System). Where identified these errors will, as detailed in relevant functional requirements, be presented in a function-specific manner. The presentation of these errors will, where practical, allow users to correct and reattempt their intended action.

An example of the presentation of a function-specific error is the demographic mismatch warning presented as part of the Document Viewer functionality.

#### Document Viewer

 PCEHR View /  Patients /  Documents

 [Different DOB][Different Family Name] (Status: DemographicMismatchWarning)

General-purposes strategies focus largely on unexpected technical errors. This includes infrastructure issues and requests that cannot be processed for technical reasons. These errors will be presented as general purpose errors to users, with additional error detail logged where practical and feasible.

An example of the presentation of general-purposes errors is the page displayed for unexpected technical exceptions.

#### Error

An unexpected error occurred.

Another example of a general-purpose error is the page displayed when a non-existent page is requested.

## Not Found

---

The requested page could not be found.

### 3.2.10 Security

The HIPS-UI Web product is secured via Active Directory and a configuration-driven security model leveraging Active Directory group membership. Users requiring access to functionality within the HIPS-UI Web product will require membership to the Active Directory group associated with the desired functionality.

If Active Directory authentication fails the user is presented with a page indicating they are unauthenticated.

## Unauthorized

---

You are not currently logged in.

If the user is authenticated via Active Directory, but not a member of the Active Directory group required to access the intended functionality, the user is presented with a page indicating they require additional permissions.

## Forbidden

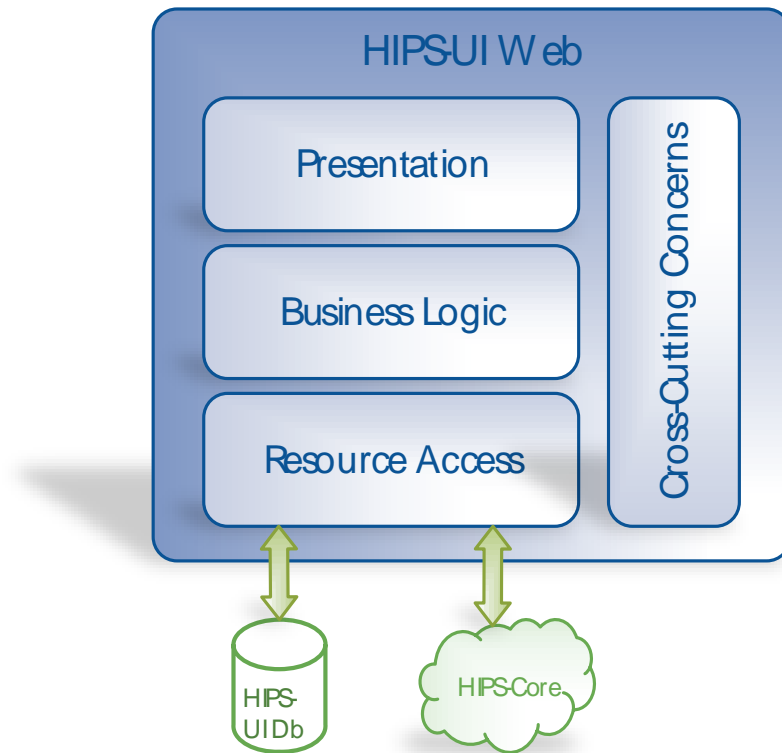
---

The requested page requires additional permissions to be accessed.

### 3.3 Technical Design

#### 3.3.1 Architecture Overview

The HIPS NPDR project will extend the existing HIPS-UI Web product to provide the PCEHR Web Viewer feature. The HIPS-UI Web product is architected as a layered web application built with Microsoft technologies, illustrated below.



The layers in the application architecture are:

Layer	Description
Presentation	Provides a web browser based graphical user interface with which users of the application interact.
Business Logic	Encapsulates the business rules, validation, and business processes for the application.
Resource Access	Provides access to external resources such as databases and web services.
Cross-Cutting Concerns	Supports elements of the application architecture that are common requirements across application layers and tiers.
Resources	External resources such as databases and web services with which the application interacts.

The HIPS-UI Web product is built upon the following technology platform:

Role	Technology
<b>Core</b>	
Presentation	ASP.NET MVC 4.0 HTML 5.0 CSS 3.0 Javascript, JSON <a href="#">Bootstrap</a> <a href="#">DataTables</a> <a href="#">jQuery</a>
Business Logic	.NET Framework 4.5
Resource Access	Entity Framework 5.0 (database) WCF 4.5 (web services)
<b>Cross-Cutting Concerns</b>	
Configuration	System.Configuration
Security	Active Directory <a href="#">MVC Authorization</a>
Exception Management	IIS 7 Error Handling
Logging & Instrumentation	<a href="#">ELMAH.MVC</a>
Caching	System.Runtime.Caching.MemoryCache
Validation	System.ComponentModel.DataAnnotations
Object Mapping	<a href="#">AutoMapper</a>
Dependency Injection	<a href="#">Ninject</a>
Unit Testing	Visual Studio Unit Test projects <a href="#">Mog</a>
Shared Logic	.NET Framework 4.5
Object Serialization	<a href="#">Json.NET</a>

### 3.3.2 Component Model

The layers in the HIPS-UI Web application architecture are realised by the following components (as Visual Studio projects that generate .NET assemblies):

Layer	Component / Project	Description
Presentation	HIPS.Web.UI	ASP.NET MVC project providing the web-based user interface for the application.
Business Logic	HIPS.Web.ModelInterface	Class Library project providing interfaces to resource repositories for the features provided by the application.
Business Logic	HIPS.Web.Model	Class Library project providing domain models specific to the application.
Business Logic	HIPS.Web.BusinessLogic	Class Library project providing business logic specific to the features provided by the application.
Resource Access	HIPS.Web.Data.Hips	Class Library project providing implementation of repository interfaces for interaction with the HIPS-Core web services.

Layer	Component / Project	Description
Resource Access	HIPS.Web.Data.WebsiteDb	Class Library project providing implementation of repository interfaces for interaction with the HIPS-UI database.
Cross-Cutting Concerns (Shared Logic)	HIPS.Web.Components	Class Library project providing shared logic required across application layers.
Several of these components will be extended by the HIPS NPDR project in order to incorporate the PCEHR Web Viewer feature into the existing HIPS-UI Web product. This is anticipated to include:		
Layer	Component / Project	Extension
Presentation	HIPS.Web.UI	Addition of <i>PcehrViewController</i> controller class, <i>Patients</i> , <i>Documents</i> and <i>Document</i> view classes and view model classes as required to coordinate and provide the user interface for the PCEHR Web Viewer.
Business Logic	HIPS.Web.ModelInterface	Addition of <i>IPatientRepository</i> , <i>IPcehrViewRepository</i> interfaces to describe contracts for interacting with resource repositories required by the PCEHR Web Viewer.
Business Logic	HIPS.Web.BusinessLogic	Not utilised by PCEHR Web Viewer.
Resource Access	HIPS.Web.Data.Hips	Addition of <i>PatientRepository</i> , <i>PcehrViewRepository</i> implementing <i>IPatientRepository</i> and <i>IPcehrViewRepository</i> interfaces respectively for interacting with HIPS-Core web services.

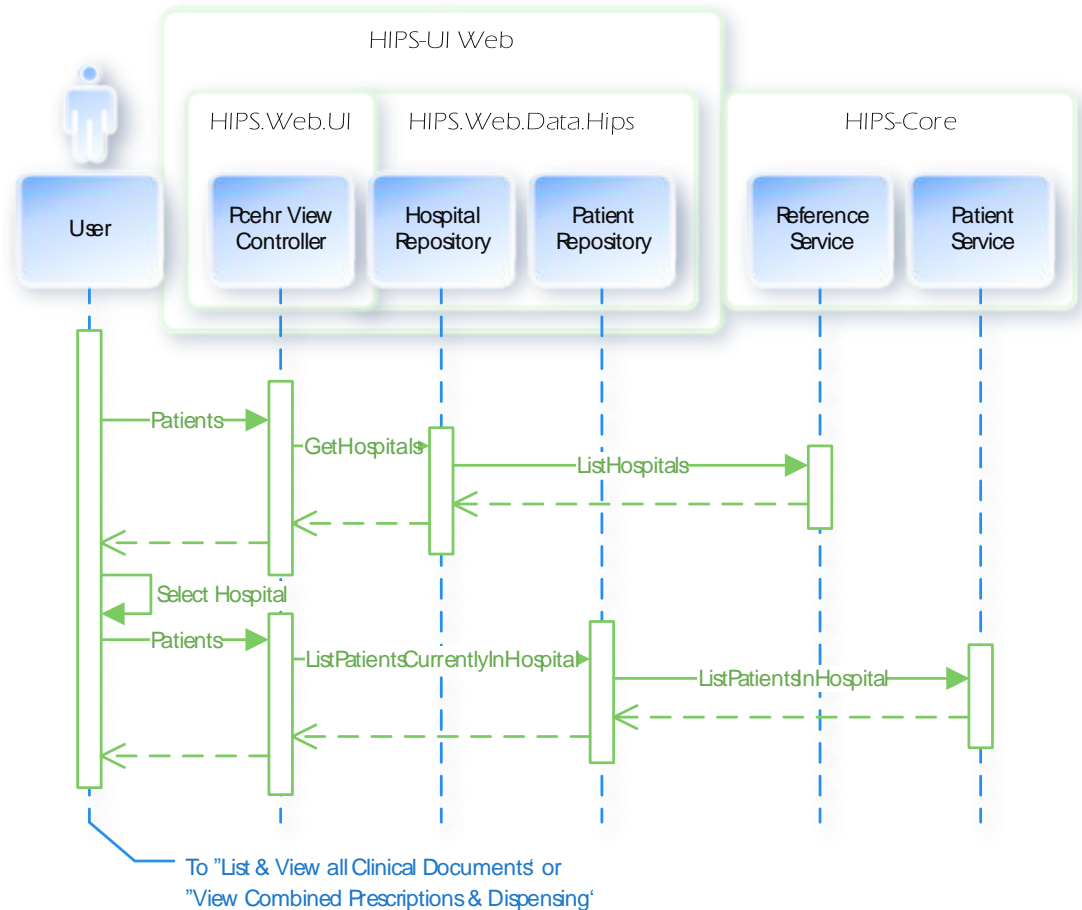
### 3.3.3 Interaction Model

The following UML sequence diagrams illustrate the anticipated interactions between the actors and components that realise the PCEHR Web Viewer feature. The diagrams illustrate both HIPS-UI Web components and the services provided by HIPS-Core it is expected to interact with.

NOTE: Diagrams favour comprehension over strict compliance with the UML standard.

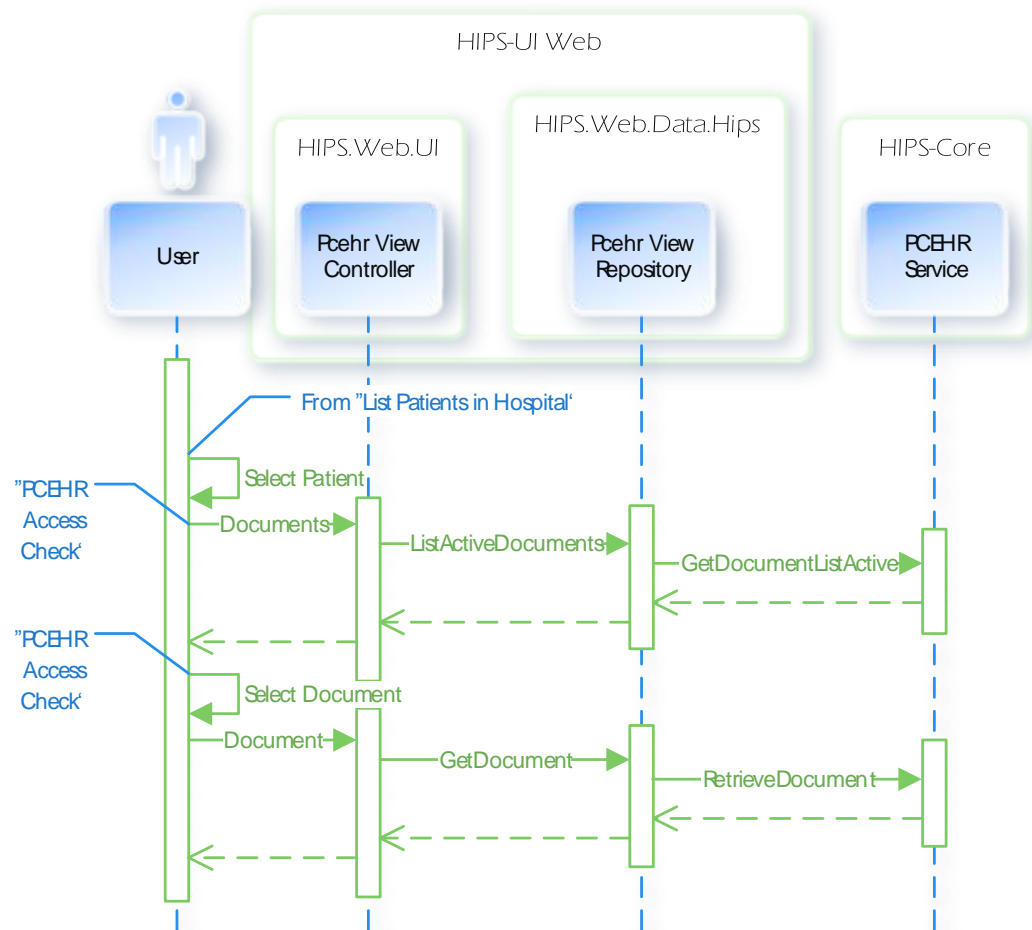
### 3.3.3.1 List Patients in Hospital

The diagram below illustrates the core interactions required to realise the "List Patients in Hospital" capability to select a hospital and list patients currently resident within the selected hospital. This capability is utilised by both the "List & View all Clinical Documents" capability (FR-1) and the "View Combined Prescriptions & Dispensing" capability (FR-2).



### 3.3.3.2 List & View all Clinical Documents

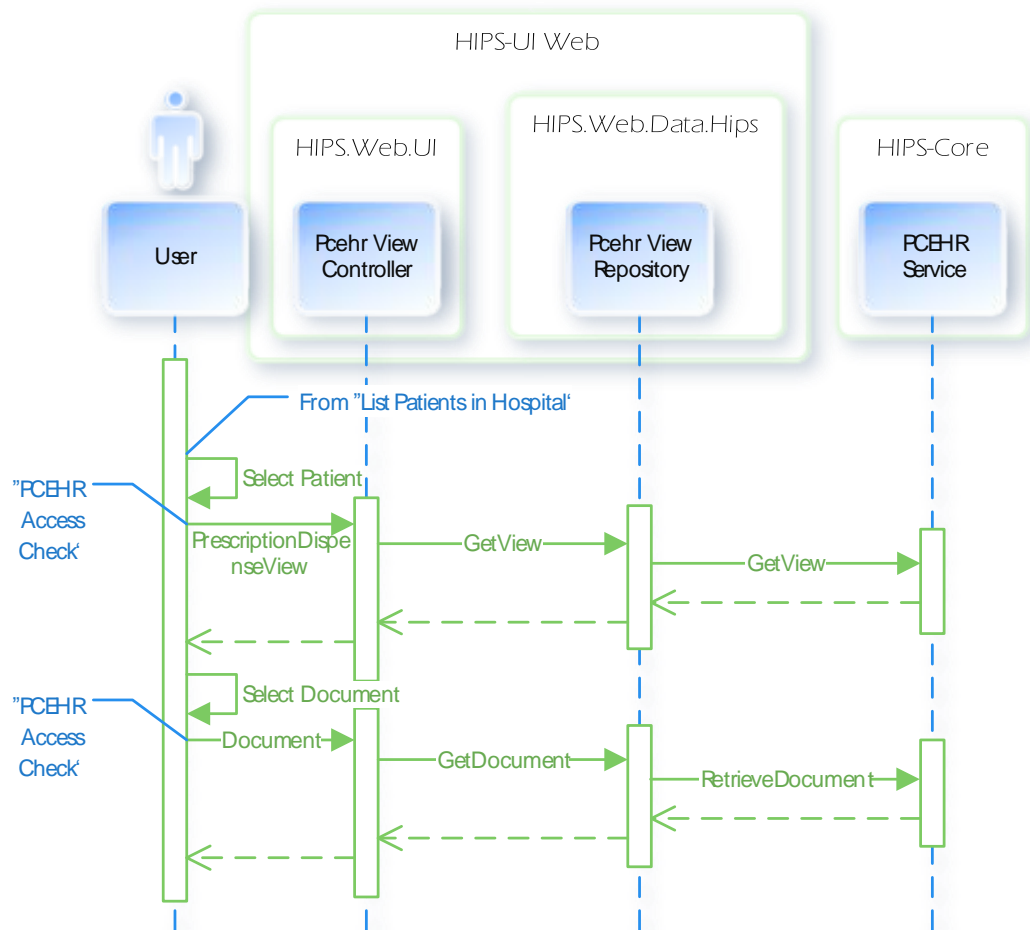
The diagram below illustrates the core interactions required to realise the "List & View all Clinical Documents" capability (FR-1) commencing with the selection of a patient listed as a result of the "List Patients in Hospital" capability.





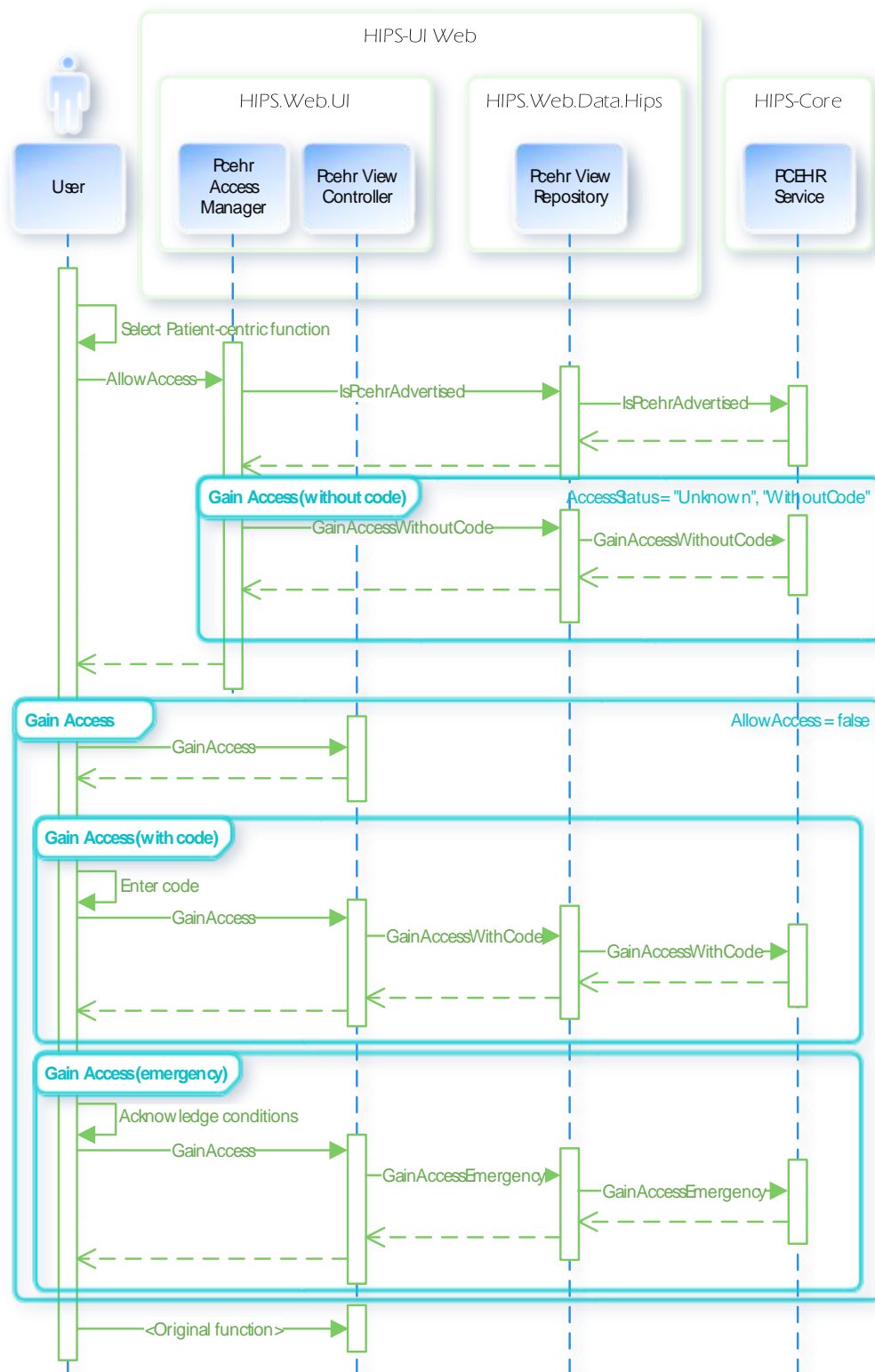
### 3.3.3.3 View Combined Prescriptions & Dispensing

The diagram below illustrates the core interactions required to realise the "View Combined Prescriptions & Dispensing" capability (FR-2) commencing with the selection of a patient listed as a result of the "List Patients in Hospital" capability.



### 3.3.3.4 PCEHR Access Check & Gain Access

The diagram below illustrates the core interactions required to realise the “PCEHR Access Check & Gain Access” capability (FR-3.2) commencing with the selection of a patient-centric function.



### 3.3.4 Deployment Model

TBD

#### 3.3.4.1 Assumed Operating Environment

The following constraints are assumed to be placed upon the operating environment of the **client system** from which end-users will utilise the PCEHR Web Viewer:

- Supported client devices:
  - PC, laptop, tablet running a supported operating system natively
- Supported client platforms (operating system):
  - Windows 7, Windows 8
- Supported client web browsers:
  - Microsoft Internet Explorer 10+
  - Google Chrome 30+
  - Mozilla Firefox 24+
- Configuration required to meet CCA conformance requirements for rendering systems (CDAR\_RS\_01):
  - Web browser configuration:
    - Printing:
      - The window title must be printed as the page header on every printed page.
      - The page footer must include the "Page N of T" marker on every printed page.
      - Background colours and images must be printed.
      - Content must be shrunk to fit the printed page.
    - The web browser must not allow users to override the presentation and style of documents rendered as HTML (eg via "developer tools").
  - Client system configuration:
    - The client system must have appropriate software installed in order to open and view document attachments including HTML, PDF, RTF and Plain Text.
    - The client system's screen resolution must be at least 1024x768 pixels.

### 3.3.5 Cross-Cutting Concerns

#### 3.3.5.1 Dependency Injection

- Ninject is used for limited dependency injection:
  - Creation & injection of repository classes and dependencies such as cache providers.
  - Creation & binding of the *PcehrAccessFilter* to controller action methods decorated with the *PcehrAccessAttribute*.
- Bindings are defined in *HIPS.Web.UI.App\_Start.NinjectWebCommon*.
- The following Nuget packages are utilised:
  - Ninject

- Ninject.MVC3
- Ninject.Web.Common

### 3.3.5.2 Caching

Caching is used where relevant within the repository classes implemented in the HIPS.Web.Data.Hips project and the HIPS.Web.ModelInterface project:

- The **HIPS.Web.Components.Cache.ICacheProvider** interface defines an interface to be implemented by cache providers.
- The **HIPS.Web.Components.Cache.CacheProvider** class implements the *ICacheProvider* interface to provide an abstract base class for cache provider implementations.
- The **HIPS.Web.Components.Cache.MemoryCacheProvider** class inherits from the *CacheProvider* class to provide a cache provider implementation based on the *System.Runtime.Caching.MemoryCache*. It supports conditional memory-based caching with absolute and sliding expiration.
- The **HIPS.Web.Data.Hips** project contains repository classes (*PatientRepository*, *PcehrViewRepository*) that accept an *ICacheProvider* instance via their constructor that is used for caching of successful results for each method invocation, with results cached by the runtime signature of the method invocation (including parameters).
- The **HIPS.Web.ModelInterface** project contains repository classes (*CachedHospitalRepository*, *CachedSettingsRepository*) that accept an *ICacheProvider* instance via their constructor that is used for caching of successful results for each method invocation.
- The *MemoryCacheProvider* is constructed and injected as relevant at runtime via Ninject. The absolute expiration used by each *MemoryCacheProvider* instance is defined in the "XXX\_AbsoluteExpirationOffset" settings in the *applicationSettings/HIPS.Web.UI.Properties.Settings* section of the application's web.config file.
- Further, the *MemoryCache* is configured via the *system.web/caching/cache* element in the application's web.config file.

#### Cache Dependencies

In order to ensure that items are removed / refreshed in the cache when the access level for an HPI-O changes (eg through an explicit "gain access"), the

#### **HIPS.Web.Data.Hips.PcehrViewRepository:**

- Creates cache dependencies between the list of documents for a patient and specific documents / PD view results (in the corresponding repository methods).
- Removes the "list of documents" cache item for the patient following a successful execution of any "gain access" repository method, causing dependent document and PD view items also to be removed.

#### Implications of Caching

The following are noted as implications of the use of memory-based caching within the PCEHR Web Viewer:

- It is recommended that the PCEHR Web Viewer not be deployed in a "web farm" (eg a network load balancing (NLB) cluster) where multiple distinct servers may service a particular request.
- Auditing implemented by HIPS-Core services will only audit the invocation of these services: if a service result is served from the cache instead of through another invocation of the providing service, the opportunity to audit this access is denied from the HIPS-Core service.

### 3.3.5.3 Error Handling

Error handling is implemented using a combination of **IIS Error Redirection** and **ASP.NET Custom Errors**. This is a contributing rationale for using IIS Express in development.

The error handling approach was designed to address the following technical intentions:

1. All errors will be displayed in a user-friendly format if possible. This includes ASP.NET runtime issues (e.g. application start errors), unhandled exceptions, default ASP.NET unsuccessful behaviours (e.g. file not found), and standard handling of intentional non-successful response codes (e.g. access forbidden).
2. If rendering a user-friendly error fails, the displayed message should not unintentionally reveal technical information.
3. It should be possible to intentionally return a response with a status code other than 200 if desired.

To meet these requirements the general high-level lifecycle of an error request is as follows:

1. A request is received by IIS and handled by the ASP.NET runtime for the HIPS Web UI application.
2. The HIPS Web UI application encounters an error or other non-standard operating condition.
3. The HIPS Web UI application returns a response to IIS with a status code other than 200. For an unhandled exception this may be a standard ASP.NET error page with a 500 status code.
4. If the response's *TrySkipIisCustomErrors* property has been set to true the response is returned verbatim to the web client. This occurs because IIS Error Redirection has been configured to process existing responses with the *Auto* behaviour which will pass-through existing responses if indicated to do so.
5. Otherwise, IIS refers to the *system.webServer/httpErrors* web configuration to determine if a mapping exists for the encountered status code. If it is a known status code IIS will execute the specified URL and return its response instead (as per the *ExecuteUrl* and *Custom* error mode behaviour settings). In the HIPS Web UI product these mappings generally execute an action on the *ErrorController* in order to display a user-friendly error.
6. If an additional error is encountered while executing the *ExecuteUrl* property (e.g. an error in the *ErrorController* or while starting the ASP.NET runtime) this will be returned verbatim. For this reason ASP.NET Custom Errors have been enabled for remote clients as a fallback to prevent exposure of technical details.

Initial HIPS Web UI configuration displays IIS redirected errors for 403, 404, and 500 status codes. 401 status codes do not redirect due to behavioural issues in Internet Explorer when using Windows Authentication and IIS Error Redirection.

By convention, errors intended for asynchronous clients (e.g. jQuery JSON requests) return a 422 status code with the *TrySkipIisCustomErrors* property set to true to enable a verbatim pass-through response.

### 3.3.5.4 Error Logging

Errors are logged using the *Error Logging Modules and Handlers for ASP.NET* or **ELMAH** package. This package uses a handler registered in the web.config configuration file and records errors to a configurable location such as a file or database store.

Additionally, the ELMAH package provides an interface to view logged errors which is by default located at the */elmah* URL path.

ELMAH is used to log:

- Unhandled errors: exceptions that are unexpected and have not been explicitly caught in application code.
- Handled errors: invalid logic paths or exceptions caught in application code, that may be catered for functionally (eg by displaying a message to the user), but which it is nonetheless desirable to log. This is achieved through an explicit call to ELMAH, for example:

```
Elmah.ErrorSignal.FromCurrentContext().Raise(new System.Exception(...));
```

### 3.3.5.5 Security

Security as described in [Security](#) is implemented using a combination of IIS Windows Security and the MVC Authorization package. This package enables security to be configured in a web.config configuration file on a per-controller or per-action basis, as well as additional policies such as 'deny anonymous users'. The configuration is loaded statically – updates to the configuration require an AppPool restart as would typically occur when changing the web.config file.

Typically this configuration will specify an Active Directory group that executing users must be a member of in order to view the desired path.

By default HIPS-UI Web specifies an MVC Authorization package which requires users to not be anonymous. However, this policy is overridden on error pages to allow anonymous users to see a user-friendly error if appropriate.

An additional feature of the MVC Authorization package is the inclusion of HTML Helpers that prevent rendering of Action Links (eg in the menu system) if the user has insufficient access.

### 3.3.5.6 PCEHR Access Check

The PCEHR Access Check capability described in [PCEHR Access Check & Gain Access](#) is implemented as an ASP.NET MVC ActionFilter in the HIPS.UI.Web project:

- The **HIPS.Web.UI.Helpers.PcehrAccessManager** class provides an *AllowAccess* method that encapsulates the logic for checking the current PCEHR access status for a specified hospital and patient and automatically attempting to gain access if possible.
- The **HIPS.Web.UI.Filters.PcehrAccessFilter** implements an MVC ActionFilter to invoke the *PcehrAccessManager's AllowAccess* method to determine if PCEHR access is allowed and either allow progress to the originally selected patient-centric function or redirect to the *GainAccess* action method of the *PcehrViewController*.
- The **HIPS.Web.UI.Filters.PcehrAccessAttribute** provides an attribute that may be applied to controller action methods to mark them for application of the *PcehrAccessFilter*.
- The **HIPS.Web.UI.Controllers.PcehrViewController** decorates its action methods that represent patient-centric functions with the *PcehrAccessAttribute*.
- A Ninject binding binds the *PcehrAccessFilter* to any controller action methods decorated with the *PcehrAccessAttribute*.
- The .NET runtime ensures the *PcehrAccessFilter's OnActionExecuting* method override is executed prior to execution of the decorated action method in the *PcehrViewController*.

### 3.3.5.7 Configuration

The following key configuration settings are configured through the web.config file. Where relevant, the file contains a description of the purpose of each individual setting.

Setting	Description
appSettings	Contains sundry application settings, in particular used to configure the ELMAH package for error logging.
connectionStrings	Contains the database connection string to the HIPS-UI Web application database in SQL Server.
system.serviceModel/client	Contains endpoint references to the deployed location of the HIPS-Core services utilised by HIPS-UI Web.
mvcAuthorization	Supports configuration of authorization rules for security features of HIPS-UI Web.
elmah	Support further configuration of the ELMAH package for error logging.
applicationSettings/HIPS.Web.UI.Properties.Settings	Contains sundry application-specific settings.

A number of additional application-specific configuration settings are configured through the "Settings" table in the application database.

### 3.3.6 Technical Considerations

#### 3.3.6.1 Assumptions

The following technical assumptions have been made during the design and development of the PCEHR Web Viewer.

ID	Description

#### 3.3.6.2 Constraints

The following technical constraints apply to the design and development of the PCEHR Web Viewer.

ID	Description
TC-1	The PCEHR Web Viewer must integrate into the existing HIPS-UI Web product. Further, as stated in NFR-7.4, it is desirable to leverage the same technology platform as that employed by the existing HIPS-UI Web product.

#### 3.3.6.3 Dependencies

The following technical dependencies apply to the design and development of the PCEHR Web Viewer:

ID	Description
TD-1	Provision of the "List & View all Clinical Documents" capability (FR-1) and "View Combined Prescriptions & Dispensing" capability (FR-2) within the PCEHR Web Viewer is dependent upon the provision of the "ListPatientsInHospital" service operation within the HIPS-Core product to enable this capability.
TD-2	Provision of the "View Combined Prescriptions & Dispensing" capability (FR-2) within the PCEHR Web Viewer is dependent upon the provision of corresponding services within the HIPS-Core product to enable this capability.

### 3.3.6.4 Design Challenges

The following challenges are anticipated during the subsequent development of the PCEHR Web Viewer:

ID	Description
TDC-1	In order for the "Document View" screen (FR-1.4) to properly display a clinical document, the contents of the document returned from the invocation of the "RetrieveDocument" operation of the PCEHRService service (including embedded objects and attachments) must be "unwrapped" and saved to a temporary location on the web server, so they can be referenced by relative location in the NEHTA-provided XSLT stylesheet.
TDC-2	There <i>may</i> be a requirement for a local implementation of the PCEHR Web Viewer to replace the HIPS-Core "ListPatientsInHospital" service operation with its own implementation <sup>14</sup> . This should, where possible, be taken into account during subsequent design and development.

### 3.3.7 Technical Design Decisions

The following technical design decisions have been made during development of the PCEHR Web Viewer:

ID	Description
TDD-1	URLs may contain potentially insecure object references. Other than as required by the in-scope compliance requirements listed in NFR-1, no effort will be applied to assessing whether identifiers employed within URLs represent a security risk or to addressing any identified risk. This aligns with the statement of XNFR-1, specifically with regard to OWASP 2013 Top 10 item A4 – "Insecure Direct Object References".

<sup>14</sup> The "Assisted Registration" feature of the HIPS-UI Web product includes a similar capability.