

HealthConnect Business Architecture

Part 3 –The HealthConnect Functional and Technical Requirements

Version 0.7

March 2002

Introduction

The HealthConnect 'system'

It is envisaged that the HealthConnect 'system' will comprise a range of systems with standardisation, compatibility and integration being key. It is currently far from clear what form these systems might take and how the functionality and scope delineation might exist. The Business Architecture defines the HealthConnect functionality from a system and business process perspective without preempting the solution(s).

The HealthConnect concept is complex and unlikely to be achieved in its entirety for many years. Systems of electronic health records have proved very difficult to design and implement successfully and hence a staged approach has been proposed. The States and Territories are to implement a series of trial projects aimed at proving the concept in niche areas while retaining the potential for wider expansion for national use.

The functional requirements detailed below define the types of functionality required by the combination of systems that could make up HealthConnect. It is anticipated that the scope of the trials will be restricted to:

- A comparatively discrete group of consumers, eg people with diabetes who live/receive treatment within a defined geographical area. This will make the issues such as consumer identification, registration and consent manageable;
- A limited number of provider/facility types and providers, eg selected hospitals, GPs and pathologists. This should assist the management of key issues such as provider identification, gaining agreement on event summaries, establishing infrastructure and training etc;
- Providers who are already information and communication technology literate and tolerant in order to minimise training requirements;
- A limited number of event summaries and views – achievable because of the targeted consumers and limited number of participants;
- Using a series of workarounds, eg use of local area or trial based identifiers for consumer identification;
- Using wherever possible existing infrastructure, data sources, provider networks; and
- A subset of these functional and technical requirements.

The challenge after the trials will be how to effectively achieve the expansion of the trial system for use on a national basis and how best to integrate the trial systems as the next step towards achieving the full HealthConnect functionality.

Functional Requirements

While the existing *HealthConnect* program is a two-year research and development activity and does not address the development of the *HealthConnect* 'System', the Business Architecture addresses the long term requirements and vision for *HealthConnect*. This is necessary to provide a framework for the trials. It is recognised that the implementation of some of these requirements will not be achievable in the short to medium term. The order of implementation of individual requirements will depend on characteristics such as value, desirability, achievability and sequencing. These may differ across the trial projects.

To give an indication of what might be achieved in the short to medium term, the individual requirements listed below have been assigned a 'timing' classification, namely:

- **Short** term: 2 years – test through trials – these functional requirements must be included in the trials;
- **Medium** term: 2-5 years – operational – functional requirements to be implemented as the project moves to a national approach/roll-out; and
- **Long** term: 5-10 years – functional requirements to support the vision of *HealthConnect*.

It is proposed that compliance with these functional requirements be sought from the trial sites. This would enable assessment of how many of the requirements are going to be addressed over the research and development period. An evaluation methodology is currently being developed.

The feedback from the trial sites will assist in determining how the migration to a national basis might be achieved. This would then require further planning and subsequent design, development and testing phases over the subsequent 3-5 years.

Business Architecture Document

The *HealthConnect* Business Architecture documentation comprises the following parts, namely:

Part 1 – The *HealthConnect* Context, which sets the boundaries for *HealthConnect* including objectives, scope, principles, stakeholders, privacy/consent issues, relationship with other initiatives as well as issues/risks (this document).

Part 2 - The *HealthConnect* Processes, which describe the major system and business processes of *HealthConnect* together with a scenario based on a person with diabetes.

Part 3 – The *HealthConnect* Functional and Technical Requirements, which tabulates the ranked individual functional requirements. The technical requirements detail at a high level the system, operational, and standards characteristics.

Attachment A – *HealthConnect* Consent Principles and Possible Models, which discusses the subject of consent and possible consent options. This is an extract from a larger discussion paper on consent currently being developed. The attachment is intended to provide the reader with some sense of the ideas being considered – ie it is not a definitive statement on the consent policy for *HealthConnect*.

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HealthConnect Functionality	Timing
1 Manage Participation	
1.1 Create/Update Consumer Register Record	
1.1.1 Consumer registration mechanisms	
1.1.1.1 Ability to register using hardcopy form keyed by operator	Short
1.1.1.2 Ability to register online, eg via a web page	Short
1.1.1.3 Ability to register at point of care, eg GP front desk, consultation, hospital admission	Short
1.1.1.4 Ability to bulk download from existing systems, eg hospital PAS, subject to consent flags	Medium
1.1.2 Consumer identification	
1.1.2.1 Ability to verify the identity of the consumer by reviewing physical evidence (to be defined)	Short
1.1.2.2 Ability to verify the identity of the consumer by access to other registration systems within the health industry subject to consent	Medium
1.1.2.3 Ability for consumer to self identify (what checks are appropriate?)	Medium
1.1.2.4 Record consumer identification – how, when, operator ID etc	Short
1.1.3 Consumer identification checking (Subject to consent)	
1.1.3.1 Ability to check existing records real time to match/merge records and reduce duplicates, eg check of variety of IDs, aliases	Short
1.1.3.2 Ability to interface to a national health identifier database (if it exists) to obtain/verify details	Medium
1.1.3.3 Ability to trigger creation of national identifier if not available, if national identifier exists	Medium
1.1.3.4 Ability to accept trigger from national identifier database (if identifier changed), and update accordingly	Medium
1.1.3.5 Where viable, interface to other consumer id systems to obtain/verify details (eg NSW Health's e*Index)	Medium
1.1.3.6 Check correlation, if possible and beneficial, with Area UPIs, State UPIs and/or MH CDLs and Medicare number/registration highlighting inconsistencies	Long
1.1.3.7 Establish local UPIs as a short term solution in lieu of the national identifier being available	Short
1.1.4 Consumer registration details	
1.1.4.1 Ability to extract some or all of the registration details from existing systems, eg practice management systems, existing registers, local medical records (subject to consent) (may not be viable as long-term solution due to data complications, compatibilities, transmissions, versioning)	Short
1.1.4.2 Ability to enter all or some of the administrative registration details, eg demographics	Short
1.1.4.3 Ability to enter some or all of the initial consumer history details – key events, allergies etc	Short
1.1.4.4 Ability to record who provided the information, eg verbal from consumer, from external system	Short
1.1.5 Manage receipt of registration request (note; this is a low-level technical requirement)	
1.1.5.1 Receive registration message and check from a technical perspective eg format (virus checking is likely to be part of network solution)	Short
1.1.5.2 Check that the originator of the message is valid	Short
1.1.5.3 Send acknowledgment/appropriate error message back to source system	Short
1.1.5.4 Date/time stamp registration request (according to standard time zone)	Short
1.1.5.5 Receipt error log to be maintained and managed	Short
1.1.6 Check registration request content (note; this is a low-level technical requirement)	

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HealthConnect Functionality	Timing
1.1.6.1 Check request for mandatory fields	Short
1.1.6.2 Send acknowledgment request content accepted/appropriate error message back to source system	Short
1.1.6.3 Content error log to be maintained and managed	Short
1.1.6.4 Create consumer registration record	Short
1.1.7 Registration Confirmation (subject to Process 1.2 Consent having been completed)	
1.1.7.1 Issue HealthConnect number (This may be an interim number with the formal HealthConnect number being issued in the medium to long term)	Short
1.1.7.2 Issue user token if required, eg smart card* (multiple for carers etc)	Medium/ Long
1.1.7.3 Send letter of confirmation to consumer – electronic or hardcopy (if required by agreed registration process)	Short/ Medium
1.1.8 Updates to registration	
1.1.8.1 Ability to update registration details, eg change of address, new allergies – manually	Short
1.1.8.2 Ability to update registration details using extracts from local system, eg, Practice Management System	Short
1.1.8.3 Ability to record update details – how, when, what, operator ID etc	Short
1.1.8.4 Ability to authenticate person updating record	Short
1.1.8.5 Ability to retain update history (for time period yet to be determined)	Short
1.1.8.6 Notification of successful update and confirmation of changes (only if required)	Medium
1.1.9 Record Maintenance (merging records will be restricted in the short term; more sophisticated matching algorithms will be defined and implemented over time, more work on identifying appropriate rules required)	
1.1.9.1 Ability to automatically review database for duplicates	Short
1.1.9.2 Ability to automatically review database for duplicates using matching protocols and algorithms	Short
1.1.9.3 Ability to merge (consolidate) records automatically subject to very restricted rules	Short
1.1.9.4 Ability to merge (consolidate) records manually - strict control mechanisms and limited access	Short
1.1.9.5 Ability to separate (deconsolidate) records manually - strict control mechanisms and limited access	Short
1.1.9.6 Ability to check entries against external systems where appropriate and match to HealthConnect	Medium
1.2 Create/Update Consent Settings	
1.2.1 Managing consumer consent	
1.2.1.1 Record initial consumer consent setting	Short
1.2.1.2 Ability to restrict consent by individual, provider type, event type, according to options available*	Short
1.2.1.3 Ability to record details of person giving consent, eg parent, guardian, power of attorney, etc	Short
1.2.1.4 Ability to search for individual providers in the case of consent being restricted to individuals*	Medium
1.2.1.5 Bulk collection of appropriate consent if available, eg if public hospital State UPIs collect consent, not just for record linkage but for EHR*	Short

* Subject to trial site outcomes

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HealthConnect Functionality	Timing
1.2.2 Updating consumer consent	
1.2.2.1 Update consumer consent if requested by consumer	Short
1.2.2.2 Withdraw consumer consent if requested by consumer	Short
1.2.2.3 Ability to authenticate person updating consent	Short
1.2.2.4 Note withdrawal of consumer consent including date	Short
1.2.2.5 Ability to revoke consumer consent in response to consumer request if authorised by the Access Control Authority	Medium
1.2.2.6 Ability to retain updated consent history	Short
1.2.2.7 Allow consumers to review their information and to select specific information not to be shared between providers/for restricted access*	Medium
1.2.3 Maintaining consumer consent	
1.2.3.1 Ability to record receipt and filing of signed consent form	Medium
1.2.3.2 Establish mechanism to confirm consumer consent at regular intervals (if requested)	Medium
1.2.3.3 Establish mechanism for recording complaints in relation to consumer consent and reporting on actions taken	Medium
1.3 Create/Update Consent Rules*	
1.3.1 Establish different informed consent models	
1.3.1.1 Have the flexibility to support a range of consent models	Medium
1.3.1.2 Be capable of changing and adding to the consent models supported	Medium
1.3.1.3 Allow HealthConnect authorised users access to consumer information in relation to their provision of a health service to that individual and in response to trial protocols	Short
1.3.1.4 Establish standard packages, eg opt in means all providers can see all information in relation to their provision of a health service to that individual other than say mental health/sexual health*	Short
1.3.1.5 Allow access to be limited to agreed combinations of individuals, provider type, facility type, event type*	Short
1.3.1.6 Allow access to exclude agreed combinations-individuals, provider type, facility type, event type, time*	Medium
1.3.1.7 Allow consumers to mask selected information	Long
1.3.1.8 Ability to expand standard package (would require new consent for existing participants)	Medium
1.3.1.9 Ability to reduce standard package (would require new consent for existing participants)	Medium
1.3.2 Establish parameters for consent management	
1.3.2.1 Establish links to provider list for options which include restricting access to individuals*	Medium
1.3.2.2 Establish list of provider types by which access can be restricted (eg doctors, allied health)	Short
1.3.2.3 Establish list of facility types by which access can be restricted (eg GP surgery, emergency depart)	Medium

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HealthConnect Functionality	Timing
1.3.2.4 Establish list of event types by which access can be restricted (eg mental health, sexual health)	Short
1.3.3 Establish specific rules	
1.3.3.1 Make certain types of information available in emergency regardless of consumer consent, eg allergies	Short

* Subject to trial site outcomes

1.4 Create/Update Provider/Organisation/Analyst Register	
1.4.1 Registration mechanisms	
1.4.1.1 Ability to register using hardcopy form keyed by operator	Short
1.4.1.2 Ability to register online, eg via a web page	Medium
1.4.1.3 Ability to bulk download from existing systems, eg provider register	Medium
1.4.2 Provider identification	
1.4.2.1 Ability to verify the identity/type of provider registering by review of physical evidence (eg check registered GP as stated)	Short
1.4.2.2 Ability to verify the identity/type of provider registering through other databases, eg provider database	Medium
1.4.2.3 Ability for provider to self identify (what checks are appropriate – see rules?)	Medium
1.4.2.4 Ability to check for existing registration real time to reduce duplicates	Long
1.4.2.5 Record provider identification – how, when, operator ID etc	Short
1.4.2.6 Ability to trigger creation of provider identifier/PKI if not available (manual in short term)	Long
1.4.3 Provider registration details	
1.4.3.1 Ability to enter all or some of the administrative registration details, eg demographics	Short
1.4.3.2 Interface to provider registers to obtain/verify details	Medium
1.4.3.3 Ability to record who provided the information, eg entered by provider, from external system etc (where possible checking to be automatic)	Short
1.4.3.4 Ability to flag selected data for restricted access over and above the defined restrictions, eg home number will not be available to consumers	Medium
1.4.4 Registration Confirmation	
1.4.4.1 Issue HealthConnect provider number (possibly use an existing number)	Short
1.4.4.2 Issue access token if required, eg PKI tool (currently available but may not be used for trials)	Medium
1.4.4.3 Send letter of confirmation to provider– electronic or hardcopy	Medium
1.4.5 Updates to registration	
1.4.5.1 Ability to manually update registration details, eg change of address, email	Short
1.4.5.2 Ability to update registration details using extracts from system, eg provider directory	Medium

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HealthConnect Functionality	Timing
1.4.5.3 Ability to record update details – how, when, what, operator ID etc	Medium
1.4.5.4 Ability to retain update history	Medium
1.4.6 Additional requirements for Organisation Registration	
1.4.6.1 Register who signed confidentiality form on behalf of Organisation	Medium
1.4.6.2 Register type of organisation – this will be used to control access	Medium
1.4.7 Additional requirements for Analyst & Researcher Registration	
1.4.7.1 Register type of analyst – this will be used to control access	Medium
1.4.7.2 Register authorisation levels provided by Access Control Authority including date, period valid	Medium
1.5 Create/Update Registration Rules	
1.5.1 Consumer Rules	
1.5.1.1 Establish rules for what constitutes a consumer	Short
1.5.2 Individual Provider	
1.5.2.1 Establish rules for what constitutes a provider	Short
1.5.2.2 Establish matrix of identification required to assign a provider a ‘type’ or other category as required by the consent/access models once defined	Medium
1.5.2.3 Establish any hierarchies required by the consent/access models eg ‘types’ may be required	Medium
1.5.2.4 Define list of functions accessible by a provider type, eg analyst cannot access GP functions, according to the agreed privacy/consent/access models	Medium
1.5.3 Organisations	
1.5.3.1 Establish rules for what constitutes an organisation	Short
1.5.3.2 Define list of functions accessible by an organisation	Medium

2 Receive and Store Event Summary	
2.1 Receive Event Summary	
2.1.1 Create Event Summary (unless created automatically within provider's system)	
2.1.1.1 Ability to select event summary type or have the provider system determine this	Short
2.1.1.2 Ability to populate key data items on the Event Summary screen with data from provider's system	Short
2.1.2 Amend Event Summary	
2.1.2.1 Ability to make changes to the ES prior to it being lodged, eg add comments, delete sections	Medium
2.1.2.2 Ability to retrieve an existing event summary, edit, add to prior to re-submission	Medium
2.1.2.3 Ability to highlight changes and record author (who, when and what) – original data never deleted	Medium
2.1.2.4 Ability to tightly control authorisation/access rights to amend functions	Medium
2.1.2.5 Ability to add a wide range of structured text fields (though limit due to difficulties in integration)	Medium
2.1.2.6 Ability to add information through free text comments fields, able to be assigned to all data groups. (however where possible structure to assist analysis and to maintain data quality)	Short
2.1.2.7 Ability to record the author of comments, assign importance ratings, monitor amendments	Short
2.1.2.8 Ability to add a wide range of additional information in a structured way	Medium
2.1.2.9 Ability to attach or supply pointers to other information – reports, images, videos.	Long
2.1.3 Manage receipt of event summary	
2.1.3.1 Receive event summary message and check from a technical perspective format, viruses etc	Short
2.1.3.2 Check that the originator of the message is valid –system,	Short
2.1.3.3 Send acknowledgment/appropriate error message back to source system	Short
2.1.3.4 Date/time stamp event summary (according to standard time zone)	Short
2.1.3.5 Receipt error log to be maintained and managed	Short
2.1.4 Check message content	
2.1.4.1 Check provider and consumer registered on HealthConnect , if not reject and send back advice	Short
2.1.4.2 If consumer ID not in message, check register using demographics (only accept if can uniquely identify)	Medium
2.1.4.3 Check event summary message for mandatory fields	Short
2.1.4.4 Check details of coding system (including version) provided alongside the code	Medium
2.1.4.5 Send acknowledgment message content accepted/appropriate error message back to source system	Short
2.1.4.6 Content error log to be maintained and managed	Short
2.2 Establish Consent Requirements	
2.2.1 Determine consent requirements	
2.2.1.1 Check consumer consent still current and includes this type of event summary	Short
2.2.1.2 Notify sender if event summary rejected for consent reasons	Short

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2.2.1.3 Possibly add functionality to trigger review of consent data if not changed for particular period of time	Medium
2.3 Check for Trigger and Respond	
2.3.1 Trigger rules	
2.3.1.1 Check event summary content against range of trigger rules	Medium
2.3.1.2 Identify trigger recipient, eg trigger rule may just say send to nominated GP	Medium
2.3.1.3 Create trigger message according to trigger rules	Medium
2.3.1.4 Check consumer consent allows trigger message to be sent (unless Access Authority overrides)	Medium
2.3.1.5 If consent overridden record why, by whom, what authority and outcome	Medium
2.3.1.6 Send trigger message to nominated providers/organisations/databases via selected mechanism	Medium
2.3.1.7 Notify submitting provider of trigger event unless excluded by trigger rule definition	Medium
2.3.1.8 Record sent and if possible record receipt acknowledgment	Medium
2.3.1.9 If transmission fails, try alternate transmission if available, eg send by email if SMS message fails	Medium
2.3.1.10 Monitor triggers sent and enable audit review	Medium
2.3.2 Set flags	
2.3.2.1 Examine content and set appropriate flags, eg flag as mental health event so that future access can be controlled	Medium
2.4 Create/Update Business rules for Triggers	
2.4.1 Rule Creation (done centrally)	
2.4.1.1 Ability to construct rules based on values of combination of data elements	Medium
2.4.1.2 Maintain series of parameter lookup tables, eg reference ranges, lists of notifiable diseases.	Medium
2.4.1.3 Define response required – format of message, selected transmission mechanism(s).	Medium
2.4.1.4 Record approval of rule by Clinical Authority	Medium
2.4.1.5 Define consent rules, eg notifiable diseases even without consumer consent (only as approved by Access Control Authority)	Medium
2.4.1.6 Record Access Control Authority approval of trigger rule	Medium
2.5 Store Event Summaries	
2.5.1 EHR Index	
2.5.1.1 Extract data required to create index, eg provider ID, consumer ID, date, event type, location	Short
2.5.1.2 Establish and manage mechanism for indexing records	Short
2.5.1.3 Index to include pointer to location of the data records/fields	Medium
2.5.2 Manage multiple versions/updates to event summary	
2.5.2.1 Check key identification data (IDs, date, event type) and establish link if same event (for management of views/research etc)	Medium

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2.5.2.2 Establish update/addition link if event summary updated	Medium
2.5.2.3 Maintain history of changes	Medium
2.5.2.4 Establish rules for management of records of consumers/providers when they opt out	Medium
2.5.3 Archiving	
2.5.3.1 Establish rules and manage the archiving of event summaries according to type, age etc while ensuring that the provision of the longitudinal health record is not compromised. Archiving legislation must be supported.	Long
2.6 Create/Update Validation Rules for Event Summaries	
2.6.1.1 Data cross checking, validation and cleansing with associated rules/policies/standards	Short
2.6.2 Validation Rule Creation Rules will be kept to a minimum, and receipt of unstructured data will be possible, though not preferred	
2.6.2.1 Define mandatory fields for different types of event summaries	Short
2.6.2.2 Ability to construct validation lists, reference ranges etc for selected data elements	Medium
2.6.2.3 Check validity of codes used against Codeset/Version, eg is it a valid SNOMED code.	Medium
2.6.2.4 Define response if required (ie error considered serious enough)– format of message, selected transmission mechanism(s).	Medium
2.6.2.5 Log validation errors for later review and management	Short

3A Generate and Deliver EHR View (Primary Uses)	
3A.1 Receive EHR View Request	
3A.1.1 Create EHR view request (unless created within provider's system and request only sent)	
3A.1.1.1 Provide list of selection of views (customised according to requestor type)	Short
3A.1.1.2 Ability to populate key data items on the parameters screen with data from requestor's system	Medium
3A.1.1.3 Ability to enter a series of additional parameters relevant to the view selected, eg date range	Medium
3A.1.2 Manage receipt of EHR view request	
3A.1.2.1 Receive EHR request message and check from a technical perspective format, viruses etc	Short
3A.1.2.2 Check that the originator of the message is valid –system	Short
3A.1.2.3 Send acknowledgment/appropriate error message back to source system	Short
3A.1.2.4 Date/time stamp EHR request (according to standard time zone)	Short
3A.1.2.5 Receipt error log to be maintained and managed	Short
3A.1.3 Check view request content	
3A.1.3.1 Check provider and consumer registered on HealthConnect	Short
3A.1.3.2 Check request for mandatory fields, eg view type, view parameters	Short
3A.1.3.3 Send acknowledgment request content accepted/appropriate error message back to source system	Short
3A.1.3.4 Content error log to be maintained and managed	Short
3A.2 Create and Update EHR View Options	
3A.2.1 Establish series of view options (controlled centrally)	
3A.2.1.1 Create data building blocks to be used in the development of view options	Medium
3A.2.1.2 Create simple front page views	Short
3A.2.1.3 Create a range of views	Short
3A.2.1.4 Ongoing extension to provide a range of flexible views as required	Long
3A.2.1.5 Enable users/organisations to customise views	Long
3A.2.2 Construct mechanics of the views	
3A.2.2.1 Ability to establish different hierarchies for views and drill down	Medium
3A.2.2.2 Establish mechanisms for view parameters, eg date ranges	Short
3A.2.2.3 Ability to highlight information added/updated since the provider last accessed the EHR.	Medium
3A.2.2.4 Ability to control access to all/ part of information based on consumer consent, provider authority	Short
3A.2.2.5 Ability to record approval of authorisation requirements by the Access Control Authority	Medium
3A.2.3 Access to the information will adhere to State and Federal legislation	
3A.2.3.1 Compliance with Standards Australia AS4590 – Interchange of Client Information (as it is developed), relevant Federal and state privacy laws/codes etc	Medium

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3A.3 Confirm Authority		
3A.3.1	Consumer authorisation (where required)	
3A.3.1.1	Record consumer authorisation provided	Medium
3A.3.1.2	Record whether consent was given for a minor or by a carer etc (only allowed according to rules)	Medium
3A.3.1.3	Record mechanism, number etc, eg smart card	Medium
3A.3.2	Check authorisation	
3A.3.2.1	Check report option definition to confirm level of authorisation required	Medium
3A.3.2.2	Check register to confirm that requestor has the authority to access this type of report	Short
3A.3.2.3	Check consumer authorisation given for this specific request (if required)	Medium
3A.3.2.4	Check consumer consent register to confirm consumer approved this type of access by requestor	Short
3A.3.2.5	Send message rejecting request if authorisation criteria not met (where appropriate)	Short
3A.3.2.6	Log successful and unsuccessful requests for audit purposes	Medium
3A.4 Retrieve EHR Data and Enhance with Decision Support		
3A.4.1	Create EHR View	
3A.4.1.1	Use EHR Index to locate and retrieve individual records/element required to make up the views	Short
3A.4.1.2	Construct the report according to the view definition	Short
3A.4.1.3	Ability to reconstruct views as they were presented to providers at a particular point in time (to satisfy legal requirements)	Medium
3A.4.2	Apply decision support rules	
3A.4.2.1	Determine whether any decision support analysis was requested as part of the view request	Medium
3A.4.2.2	Identify any decision support rules automatically applicable to this type of report	Medium
3A.4.2.3	Implement rules and determine appropriate response if any, eg alert - limited functionality in short term	Short
3A.4.2.4	Link to external decision support system if applicable	Medium
3A.5 Create/Update Decision Support Rules		
3A.5.1	Rule Creation (done centrally)	
3A.5.1.1	Ability to construct rules based on values of combination of data elements	Short
3A.5.1.2	Maintain series of parameter lookup tables, eg reference ranges	Short
3A.5.1.3	Define response required – format of message, selected transmission mechanism(s).	Short
3A.5.1.4	Record approval of rule by Clinical Authority	Medium
3A.5.1.5	Define consent rules as approved by Access Control Authority	Medium
3A.5.2	Examples of types of potential decision support functionality (HealthConnect will support but not replace systems that carry out complex decision support functions)	
3A.5.2.1	Alerts (check overlap with other systems, eg Gentamicin order triggers creatinine clearance results) - limited	Short

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functionality in short term	
3A.5.2.2 Medication decision support – drug interactions, medication allergies, alerts and dose reminders (through BMMS when available and local prescribing software)	Medium
3A.5.2.3 Electronic prescribing with decision support (through external systems eg local prescribing software)	Medium
3A.5.2.4 Reminders	Medium
3A.5.2.5 Clinical pathways	Long
3A.5.2.6 Electronic booking	Long
3A.5.2.7 Accommodate state specific requirement	Medium
3A.5.3 Education	
3A.5.3.1 Access to best practice guidelines/latest research	Medium
3A.5.3.2 Access to remote knowledge/literature databases approved by Clinical Authority, eg CIAP, Health <i>Insite</i> , Medline	Medium
3A.5.3.3 Access to appropriate consumer education databases	Medium
3A.5.4 Research (with appropriate ethical clearance)	
3A.5.4.1 Access to educational links relevant to clinical profile	Medium
3A.5.4.2 Environmental and epidemiological analysis	Medium
3A.5.4.3 Link to population statistics for analyses	Long
3A.6 Transmit EHR View	
3A.6.1 View EHR Report	
3A.6.1.1 Display view at desktop through Access System, eg web	Short
3A.6.1.2 Ability to download complete view into a separate file into local application (non-editable)	Short
3A.6.1.3 Ability to select only specific sections into local application as non-editable blocks	Medium
3A.6.1.4 Ability to download selected information at field level into local application	Long
3A.6.1.5 Ability to download data into analytical tools	Medium
3A.6.2 Manage transmission/receipt of data	
3A.6.2.1 Determine whether receiving location is valid	Short
3A.6.2.2 Record information sent for auditing purposes with time/date stamp	Short
3A.6.2.3 External system to acknowledge receipt	Short
3A.6.2.4 Record to be resent x times if no acknowledgment received	Short
3A.6.2.5 Error log to be maintained and managed	Short
3A.7 Create/maintain metadata	
3A.7.1 Management	
3A.7.1.1 Develop and maintain metadata definitions – simple	Short
3A.7.1.2 Develop and maintain metadata definitions – detailed	Medium/ Long

3B Generate and Deliver Report (Secondary Uses)	
3B.1 Receive and Check Secondary Uses Report Request	
3B.1.1 Create EHR report request (possibly created by central processing unit)	
3B.1.1.1 Provide list of selection of reports (customised according to requestor type)	Short
3B.1.1.2 Ability to populate key data items on the parameters screen with data from requestor's system	Medium
3B.1.1.3 Ability to enter a series of additional parameters relevant to the view selected, eg date range	Medium
3B.1.2 Manage receipt of EHR report request	
3B.1.2.1 Receive EHR request message and check from a technical perspective format, viruses etc	Short
3B.1.2.2 Check that the originator of the message is valid –system	Short
3B.1.2.3 Send acknowledgment/appropriate error message back to source system	Short
3B.1.2.4 Date/time stamp EHR request (according to standard time zone)	Short
3B.1.2.5 Receipt error log to be maintained and managed	Short
3B.1.3 Check report request content	
3B.1.3.1 Check provider registered on HealthConnect	Short
3B.1.3.2 Check request for mandatory fields, eg view type, view parameters	Short
3B.1.3.1 Check that approval from the Access Control Authority exists where necessary	Medium
3B.1.3.2 Check if request for aggregated data is likely to reveal personal health information and reject if authorisation does not allow this	Medium
3B.1.3.3 Check if the request is likely to demand significant computing resources to compile and reject/schedule appropriately	Medium
3B.1.3.4 Send acknowledgment request content accepted/appropriate error message back to source system	Short
3B.1.3.5 Content error log to be maintained and managed	Short
3B.2 Generate and Review Secondary Uses Report	
3B.2.1 Locate relevant records	
3B.2.1.1 Use EHR Index to locate and retrieve appropriate population	Medium
3B.2.1.2 Eliminate if consumer information not flagged as not available for the requested secondary use	Medium
3B.2.1.3 Extract relevant data from available event summaries	Medium
3B.2.1.4 Extract relevant data from available event summaries	Medium
3B.2.2 Create EHR Report	
3B.2.2.1 Create unit records, strip identifying information	Medium
3B.2.2.2 Create aggregated data report	Medium
3B.2.2.3 Check for risk of potentially identifying information eg small cell inference and modify	Medium

3B.3 Issue Secondary Uses Report	
3B.3.1 View EHR Report	
3B.3.1.1 Display report at desktop through Access System, eg web	Short
3B.3.1.2 Ability to download complete report into a separate file into local application (non-editable)	Medium
3B.3.1.3 Ability to download data into analytical tools	Medium
3B.3.2 Linkage Report	
3B.3.2.1 Download linkage data to the Access Control Authority for subsequent issue to a trusted linkage agent, eg ABS	Medium
3B.3.3 Manage transmission/receipt of data	
3B.3.3.1 Determine whether receiving location is valid	Medium
3B.3.3.1 Record information sent for auditing purposes with time/date stamp	Medium
3B.3.3.2 External system to acknowledge receipt	Medium
3B.3.3.3 Record to be resent x times if no acknowledgment received	Medium
3B.3.3.4 Error log to be maintained and managed	Medium

Key Issues relating to Functional Requirements

Issue: National Focus

A major challenge will be achieving the migration from the research and development phase to and beyond the trial implementations to the national implementation. It is not possible to resolve this issue at this point in time. The HealthConnect Program Office will be looking for input relating to the national implementation from sources such as:

- The State and Territory trials
- The BMMS trials
- Projects being undertaken from the Health Insurance Commission, for example the Data Warehouse Project (HALO) could provide an opportunity to learn about development, storage and control processes for ensuring data quality.
- Provider directories
- Good Electronic health Record

The HealthConnect Program Office also proposes to investigate which of the HealthConnect functions might benefit from being established nationally, providing support to the local applications that will comprise the HealthConnect 'system'.

Technical Requirements

In addition to the functional requirements a list of technical requirements have been developed (presented below). These technical requirements have been developed from business needs, eg speed of response has a major business impact.

These requirements are by no means comprehensive and it is anticipated that they will be used as input to the Systems Architecture, which will define these and other technical aspects of HealthConnect more fully.

There has been no intention to preempt technical solutions, though in some cases examples of specific technologies have been cited to assist communication of the underlying requirements. International aspects of standardisation and harmonisation issues will need to be considered determining the technical options eg once systems become Internet enabled or even simply message enabled through electronic mechanism then there are international implications.

4 Technical Requirements	
4.1 Access to HealthConnect through:	
4.1.1 Readily accessible applications – viability of agreed set of selected browsers including their versioning and other technology to be investigated	Short
4.1.2 Integration to desktop eg practice management software (it is anticipated that integration in the short term will be limited to supply of event summaries)	Short/ Medium
4.1.3 Interfaces to other applications	Short/ Medium
4.1.4 Workstations at the clinicians workplace (general practices, specialist, hospitals, community care)	Short
4.1.5 Home PCs (for clinicians, consumers) – implications for OS versions and hardware eg smart cards/dongles to be considered.	Medium/ Long
4.1.6 Call Centres	Medium
4.1.7 Public access points, eg booths at government shopfronts or provider institutions with assistance if desired	Long
4.1.8 Mobile/hand held devices, eg ambulances (short term concerns – security, lack of maturity of technology)	Medium/ Long
4.1.9 Printed copy (eg consumer given copy during GP consultation, copy sent to medical record printer?)	Short
4.1.10 The range of access mechanisms should support access by consumers with special requirements, such as people with disabilities, the elderly, computer illiterate, socially disadvantaged, different cultural backgrounds, living in remote areas, etc	Medium
4.2 Performance characteristics	
4.2.1 The EHR system must have a high level of availability ie 99.9x% uptime (% to be agreed)	Short
4.2.2 The EHR system must be reliable	Short
4.2.3 The EHR system must be supported 24x7	Short
4.2.4 Access to the front summary view of a consumer record must be achievable within say 5 seconds (# of seconds to be agreed)	Short
4.2.5 Access to simple drill down pages must be achievable within say 5 seconds (# of seconds to be agreed)	Short
4.2.6 (Network latency cannot be controlled on the Internet)	
4.2.7 Access to complex drill down pages must be achievable within say 10 seconds requiring data from more than 1 repository/system – includes network communications) (# of seconds to be agreed)	Short
4.2.8 Selected event summaries must be lodged, stored and data available for incorporation into views within say 10 minutes of the event summary being submitted to the EHR system (# of minutes to be agreed)	Short
4.2.9 Other event summaries may be lodged and updated in a batch or overnight mode, according to	Short

predefined rules	
4.3 Storage Location	
4.3.1 Create national health information network of repositories (with appropriate security)	Long
4.3.2 Central repository of selected data (with appropriate security) – this is only expected to be viable for the trials with limited users, data and geographical coverage	Short
4.3.3 Linked regional repositories of selected data (with appropriate security)	Medium
4.3.4 Query access to local repositories ie local storage by the providers of event summaries(with security)	Medium
4.3.5 Query access to source systems ie the providers operational system (security = major issue, so this may not be viable)	Long
4.3.6 Minimal duplication of data to reduce potential problems with data integrity	Short
4.4 Database structure	
4.4.1 Store in standard format so that views can be assembled in different ways. (data structure to be devised to accommodate the information as well as the primary business and operational requirements)	Short
4.4.2 Store information in a consumer centric manner	Short
4.4.3 Flexible structure to enable easy expansion or changes to data collected and stored	Short
4.4.4 Stored in a way that makes access to information efficient, both for EHR views and research reports	Short
4.4.5 Analysis tools to support the extensive reporting requirements in a flexible and efficient manner	Long
4.5 Messaging standards	
4.5.1 Use extraction process viable – dictated by systems selected for implementation	Short
4.5.2 Use agreed messaging standards to transmit event summaries (eg HL7 broadcast messaging standards – currently V2.3.1 though V3 is shortly to be implemented, or possibly the use of XML with 2.4) – to be addressed in the Systems Architecture	Short
4.5.3 Use agreed messaging standards to transmit queries and receive query results– to be addressed in the Systems Architecture	Short
4.5.4 Update messaging standards to comply with new versions	Medium/ Long
4.5.5 Possibly use short term solutions until the messaging standards have been developed sufficiently to support HealthConnect (eg possibly use a HL7/XML combination for text messaging until agreed standards/frameworks developed)	Short
4.5.6 Expand use of messaging standards as new standards developed, eg Event Summary messaging standard	Medium/ Long
4.5.7 Ensure that the messages that are being generated and accepted are standardised.	Short
4.6 Infrastructure/Network	
4.6.1 Access to HealthConnect should be possible through basic workstation configurations (to be defined) to	Medium

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	ensure equity of access (this may be a short term requirements depending on current infrastructure	
4.6.2	Bandwidth requirements should be minimal; dial up access for limited functions should be viable	Short
4.6.3	Network access should be available throughout Australia (including phone line connection either land line, mobile or satellite)	Long
4.6.4	Level of infrastructure penetration required should enable equity of access (particular consideration should be given to general practice, consumers, specialists and rural/remote health service delivery, eg NT and WA)	Long
4.6.5	Potentially use existing virtual private networks (such as the NZ HealthLink which is being implemented in some sectors in Australia). This may create equity of access issues.	Short
4.7 Network Security		
4.7.1	Mandated security and encryption for inbound and outbound messages	Short
4.7.2	Establish appropriate security infrastructure, eg Firewalls	Short
4.7.3	Mandate level of compliance and mandatory update schedule for anti virus programs if required (depends on the technology platform selected)	Short
4.8 Access Security		
4.8.1	Public Key Infrastructure (PKI) certificates and software to use the certificate (short term if possible)	Medium
4.8.2	Ability to use Secure socket layer (SSL) for secure browsing if appropriate to technology selected (SSL V 3 provides encryption but no appropriate access control – need to check whether this is sufficient) and possibly PKI for access control	Short
4.8.3	Mechanisms for digital signature/keyword protection – provider	Short
4.8.4	Mechanisms for digital signature/keyword protection – consumer	Medium
4.8.5	Set time limit on keyword (software dependency)	Short
4.8.6	Ability to change/reset keyword software dependency)	Short
4.8.7	Virus scan encrypted files	Short/medium
4.9 Data Quality/Audit		
4.9.1	Data quality reviews, eg data integrity checks, checking for duplication, transaction analyses	Medium
4.9.2	Establish mechanisms to minimise data integrity problems eg try to eliminate problems that are common in existing EHR systems where users tend to enter incorrect values into fields making decision support infeasible	Medium
4.9.3	Establish mechanism by which changes to incorrect data can be tracked and audited.	Short
4.9.4	Enable security to be applied to specified fields to prevent data being altered.	Short
4.9.5	Prevent key data from source system being altered, eg part of a pathology result	Short
4.9.6	Date/time stamps – for event took place, committed to EHR, accessed etc	Short

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4.9.7 Provide a transaction audit trail that captures the IDs and date/time of individuals accessing/altering/extracting data	Short
4.9.8 Provide ability to recreate a view, eg ability to show for legal purposes what information would have been shown to a particular provider at a specified date and time.	Medium
4.9.9 Audit and archiving of signed documents	Medium
4.10 Data recovery	
4.10.1 Establish backup/recovery procedures for the initial databases + testing procedures.	Short
4.10.2 Establish backup/recovery procedures for the distributed databases which form the EHR	Medium
4.10.3 Mandate back up and testing procedures for regional repositories	Long
4.10.4 Enable distributed transactional capabilities	Short
4.11 Data archiving	
4.11.1 No archiving required in short term though strategy should be established	Short
4.11.2 Establish different archiving rules dependant on type of data, eg forever, some pathology tests archived after 2 years, others maintained from 10 years etc (as defined and approved by Clinical Authority) – must not compromise integrity of longitudinal health record	Medium Long
4.11.3 Comply with statute of limitations for retaining data (eg for paediatric and child health/neonatal)	Medium
4.12 Maintainability	
4.12.1 Solution must be easy to use for the end user.	Short
4.12.2 Structured, modular system to assist maintainability of what will be a complex integration of databases, modules and software products	Medium
4.12.3 Solution must be maintainable, eg not require ongoing updates to s/w on individual machines	Medium
4.13 Policies and procedures	
4.13.1 Necessary policies and procedures to be documented, implemented and monitored	Medium

Key Issues relating to Functional and Technical Requirements

Issue: Value Proposition

The functional and technical requirements listed represent the requirements identified to date. There has been no attempt at this stage to cost these requirements and to identify whether there are cheaper alternatives.

In determining how to implement the requirements it is important to focus on the “value proposition”. Separating requirements specification from costs is likely to lead to poor economic investments. There will be many instances where meeting the requirements will impose levels of cost which outweigh the value. Area of potential high costs which need to be investigated include:

- Availability - making data available 24x7– clearly if this can be achieved at minimal additional cost it is desirable, in practical terms availability does impose costs.
- Security has significant performance implications. The security versus cost versus performance balance needs to be looked at in more detail, using existing experience from projects.
- Audit trails have significant storage requirements. Existing implementations (eg pathology labs, hospitals, GP) can provide concrete data on the cost/value of this.
- Consent model – cost is likely to increase exponentially with the complexity of the model

Individual business uses also impose different constraints. For example, the access response time requirement differs between environments:

- in an emergency situation, certain data must be available immediately to be of any use, or else decisions will be made in the absence of such information and no value will be realised;
- in the case of a consumer attending a specialist who books ahead weeks in advance, data could be theoretically extracted at any time prior to the appointment; and
- in general practice, where most patients make appointments hours to days in advance, the information availability requirement is intermediate.

What functionality should be selected and what dropped needs to be considered taking into account target groups, infrastructure and costs to the community. The functionality must be able to be translated to low-infrastructure health service providers – otherwise there is a risk of perpetuating inequity in the health system.